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PAPERS READ BEFORE THE SOCIETY.

1921-1922.

*Meeting at 21, Gower Street, W.C. 1, on October 10th, 1921,
at 8 P.M.*

I.—NOVELTY.

THE PRESIDENTIAL ADDRESS.

By F. C. S. SCHILLER.

SINCE you have chosen me to be your President for this Forty-third Session of our Society, and since this honour imposes on me the duty of delivering a Presidential Address, you may fairly be said to have asked for it. And I, of course, am not the man to let you off. You are going to have it all right, and I expect that, before I have done, most of you will have had your patience severely tried. But the fault is yours, not mine, if we have to-night to consider the most detested of subjects, which runs odiously counter to every instinct and every habit of every being, animate and inanimate. Even a desperado like myself would hardly have dared to intrude it upon a gathering of respectable philosophers, if he could not quote precedents and claim support; if, that is, the greatest of living metaphysicians had not so effectively pleaded for a revision of the old Eleatic verdict, to which nearly all philosophers have assented with such uncritical docility and unthinking enthusiasm, that no place need be made for Novelty in our philosophies, because Novelty is as such ultimately unthinkable and impossible. Perhaps M. Bergson's greatest achievement is to have shaken this prejudice, and to have made Novelty a good philosophic problem. It is no longer mere impertinence to inquire into Novelty, to ask philosophers to recognize its existence, to beg

them to analyse why they hate it and won't, and to insist that, whether they hate it or not, they have got to have it. If I do not suffer the fate of Pentheus, Galileo, or Bruno, before I have sufficiently elucidated these points, I may perhaps persuade one or two that since Novelty is ineluctable and we are all so constructed as to experience it, and the world is continually generating it, it may be more reasonable, or at least more sensible, to try to understand it than to try to ignore it.

For the benefit of these few, let me outline the scheme of this paper. My aim will be not so much to dazzle you with paradoxes, to ventilate novelties of detail, or to advocate new solutions for secular problems which have proved impervious to philosophic penetration for the past 3000 years, as to examine Novelty in principle, and to determine the conditions under which it may hope to obtain recognition in a rational conception of reality. I propose to show: I, that Novelty, really and naturally, exists, or rather occurs; II, that hatred of it exists, and is man's normal attitude; III, that this hatred is natural, and in a sense reasonable, but that IV, it should not goad us into denying Novelty. It is better to make the best of it, and of the consequences of recognizing it, in V, Logic, VI, Metaphysics, and VII, Religion.

I.

The short proof of the existence of Novelty consists of pointing to an obvious, all-pervasive psychical fact which is familiar to every one, and will, I suppose, be equally distasteful to the refined philosophers who feel it an insult to their intelligence to be asked to recognize the reality of a mere fact, and to the sturdy heretics who have found no use for mind in their philosophizing. The former will declare it unintelligible, incredible, and therefore impossible; the latter will decry it as "subjectivism." Still it is a simple psychical fact that our experience never quite repeats itself: in what we *call* "the same," and are tempted to regard as a recurrence of the same

experience, differences may always be detected, if we choose to attend to them. Even if there were no others, the mere fact that an experience had occurred before would make a difference. For the first time it came it was accompanied by a feeling of novelty; when it is repeated, this feeling is lost, and its place is taken by a growing sense of familiarity with infinite gradations of intensity. We know in advance what it will feel like and anticipate it with pleasure or repugnance, hope or apprehension, with interest, indifference, or tedium; thus the very fact that an experience is no longer "new" introduces a new factor. Even if we have more or less forgotten the first experience, it will "come back" to us the second time, and whether or not we remember it, there is reason to believe that the course of events will in all cases proceed differently in consequence of the past, and that so nothing is ever wholly forgotten and as though it had never been; indeed there would be no conceivable proof of such total oblivion except just this, that the course of events *did* repeat itself completely. And this does not appear to be the case. Instead it appears to be an ultimate fact that every mind which apprehends a fact has had a history, and this history makes a difference and affects its apprehension of the fact.

What is true of the mind holds moreover, no less, though less manifestly and indisputably, of the rest of reality. Its history too does *not* repeat itself absolutely, but only with a difference. The flow of reality sets in one direction only, and carries with it its whole past: everywhere the very fact that something has occurred before affects the way "it" happens the next time. This, ultimately, is the reason why the past is irrevocable and the course, even of physical change, is irreversible. It is the reason also why the future is never quite exactly calculable.

We may say then that all things are what they have become, and have become what they are, in virtue of what they have been through. Their history is thus always relevant to their "essence," and until we have ascertained it, we must not take

too seriously our definitions of the latter, and the inferences drawn from it. Aristotle made a gallant attempt to bring out this relevance of history to definition in his *τό τι ἦν εἶναι*, but his successors have too often failed to see that this clumsy phrase embodied a truth that was lacking to their "eternal" essences.

Now practical psychologists have, of course, long been aware of all this. They have known that, to forecast a man's action with any precision, it was vain to appeal to general principles, and necessary to know him, and his past, and if possible that of his ancestors. In these days the other sciences are being forced to similar admissions. The zoologist could never understand the nature and relations of living beings, until he took to working out their history: now he explains the present by the past, and solemnly tells us that we have five fingers because we have retained the primitive pentadactylism of the vertebrate stock! The astronomer nowadays is not content to speculate about a "primitive nebula" out of which our solar system was condensed; he extends and confirms his theory by conceiving it as a special (and very rare) case in the processes of "stellar evolution," and classifies the stars according to the stage in it which they have reached. The geologist is successfully connecting the character of his minerals with their history, and determining their age (and incidentally providing data for that of the earth) by the varying amounts of their "radio-activity." With the discovery of "isotopes" history has become relevant to chemistry, and chemists are growing chary of predicting how a given sample of a chemical element will behave and of declaring what it "is," until they have ascertained its history: for a given piece of "lead" may be "thorium-lead" or "uranium-lead," or, more probably, a mixture descended from both these "parents," and its "properties" will be affected by its ancestry. Ultimately, it seems likely, that all the "elements" will be found to be mixtures of isotopes.

In short, as we probe deeper, all the objects of scientific

interest are turning out to be immensely more complicated, individual, nay unique, than any one suspected: the simple, sweeping affirmation of universal "laws," "eternally" prescribed to all things, is being more and more plainly revealed as a convenient postulate of method, which the sciences assumed in the hope of controlling their material, and which encourages them to sustain their struggle with the facts. But actually *our* "laws" are always human inventions and cannot survive without large doses of human fiction. Reality, as we get to know it better, is displaying a character, nay a will, of its own, and a large measure of recalcitrance to our intellectual demands. Of this recalcitrance Novelty is a conspicuous feature, and one that is intimately bound up with the rest.

II.

Here then is our first reason for hating Novelty. It is a good scientific reason, and proves that the reasons for our hatred are not all disreputable. But of course we have others, still more potent, in which we cannot take such pride.

In the first place we are all the creatures of Habit. Habit is the greatest force in nature, and the natural enemy of Novelty. All the stability that can be traced in the flux of reality may be ascribed to it. All the Laws of Nature, in so far as we have hit upon formulas that really hold, and are not fictions of our own invention and subjective conveniences of calculation, are objectively the *habits* of nature. The stability of these habits is (more or less) an empirical fact, and the sole basis for our predictions and preparations for the course of events. We naturally, therefore, tend to idealize and exaggerate it, and to resent the intrusions of Novelty.

Furthermore, the rule of Habit extends to ourselves. We too are made up of habits, and ensconce ourselves in them for safety. Those who are conscious of this fact call themselves "conservatives"; those who are not may imagine themselves "liberals," "radicals," or even "revolutionaries." But they

too cannot help being conservative *au fond*, simply because they too have habits.

Fundamentally then human nature is conservative—for good and evil. It engenders a conservative bias, which pervades all social structures and all human institutions, and tips the balance against novelties of (almost) every kind.

Novelty is normally painful—psychologically painful—because it demands an infraction of habit, an effort, a re-adjustment, thought, doubt, experiment, uncertainty, difficulty, strain, and, possibly, failure. Inertia, laziness, custom, timidity, stupidity, the whole brood of Habit and Ignorance, combine their forces to repulse the new. They always succeed at first, and are never routed without a severe struggle.

Of course this is not to assert that all novelties are always detested in every department of life. There are exceptions, or apparent exceptions, notoriously; but they “prove the rule,” and their analysis is very instructive.

The most striking case, probably, is that of “fashion.” The realm of fashion is under the spell of the new. The new is habitually valued as better than the old, and imposed on all who would be “in the fashion.” And who would not? For to be “old-fashioned” is to expose oneself to ridicule and contempt. To be arrayed in what “is not worn” is a more heinous solecism than to do what “is not done.” At bottom, however, both of these social *tabus* have a common root in custom, and custom is merely social habit. This prerogative position of Novelty in matters of fashion is not, however, a wholly spontaneous growth. The mutability of fashion is provided for by an elaborate organization which is the product of an advanced civilization. In a primitive society the fashions of dressing one’s hair and tattooing one’s body do not change. They are tribal habits, and it would bring calamity upon oneself and the whole tribe to innovate upon them in the slightest degree. Why? There does not yet exist a class of specialists whose business it is to change the fashions, and who are interested in

their continual renovation. *Chez nous* the fashions change annually—because this is good for the trade of milliners and tailors. They plunge us from one extreme into the opposite, in order that any woman may tell at a glance whether her less fortunate rival is still wearing a dress that was fashioned last year! And they know full well that no self-respecting woman can bear to be out of fashion. Hence their power. Hence the “last cry” of the feminine soul is for the “last novelties” of Paris. Men’s fashions do not change so rapidly, because men are more resistant to the suggestions of the herd instinct, and refuse to follow the behests of their tailors, who therefore wisely do not insist on an annual change.

The human appetite for “news” seems another objection to the contention that novelty is not beloved. This is a fairly complex craving, but in the main it may be regarded as an adaptation. We must somehow adapt ourselves to a world that engenders novelties. Also life is actually such that nearly all are always hoping and looking for news of a better. What is surprising, therefore, is that the craving for news is not stronger. Of course, however, these remarks do not exhaust the philosophy of the “newspaper” and its social functions.

The apparent love of change for its own sake may receive a similar explanation. We try to escape from a reality that is unsatisfactory, and may even be driven to do “anything for a change,” despite proverbial warnings against leaping from the frying pan into the fire.

A more serious example of a department of life which seems to look with favour upon novelty is science. In the last century or two quite a number of human societies have developed quite a considerable enthusiasm for new discoveries in science, and are no longer disposed to accept as final the wisdom of their ancestors. But this sentiment is quite explicable. It has grown up since science was enlisted in the service of man, made itself technically useful, and set itself to gratify human desires for material goods. As there are a

multitude of things men desire but do not possess, they welcome anything new that holds out a prospect of giving them what they want. But of course it should be noted that novelties do not break through in science without a struggle. There is always a conservative party which will not scrap the old and resists innovation, often to the death, and is only vanquished by the perfecting of the new invention and its manifest working, or, in extreme cases, has to be left to die out.

Philosophy has no such motives to welcome novelty. Accordingly it doesn't. The actual history of philosophy exhibits very little of it, in proportion to its length. Hardly half a dozen really new ideas seem ever to have forced their way into its tradition, to infuse fresh blood or to put a new complexion on the mummy cases of its problems. I cannot stop to enumerate them now, but there is no need to wonder at the unprogressiveness of philosophy, which its typical votaries are wont to mistake for an assurance of its eternal truth.

It is clear then that the human attitude towards Novelty is not quite uniform. It varies according to the subject. But our fundamental bias is always hostile, and our concessions to novelty are always extorted. Mostly by the force of fact. For Novelty exists and is all-pervasive. We cannot avoid it, try as we may; but we can deceive ourselves about its existence and disguise our acceptance of it. And so we do! We declare that "there is nothing new under the sun." And we prove our dictum true, by never accepting a new truth until it is old and has been licked into shape. So a really new and important truth will bear "discovery" over and over again, for centuries. The first dozen times or so it simply is not comprehended, the next, it is not listened to, because the times are not "ripe" for it. By the time they are, it can always be shown not to be really shocking because not really new at all: and some one can always earn a living by expounding the ancient sages who discovered it long ago and were forgotten for their pains. Thus the Copernican Revolution was nothing new, because it

had been, vainly, urged by Aristarchus of Samos. Darwinism was nothing new, because it was anticipated by Anaximander. Relativity is nothing new, because it is embraced in the great principle of Protagoras, from whom Humanism also may trace its descent. In short, any novelty worth worrying about may be discovered over and over again, like America.

A novelty, therefore, like a *parvenu*, can always be provided with a pedigree, once it has succeeded. This is very comforting; but it is only part of the social *camouflage* which blinds us to the occurrence of the new.

III.

To the same system of devices belong at bottom the methodological assumptions by which we render calculable the course of events and construct stable "objects" for the sciences to contemplate. It is traditional to erect these into idols for philosophic worship under such names as "*a priori* necessities of thought," in order to evade the paradox that the road to scientific truth is paved throughout with postulates and fictions. Scientific novelties also are reached by first pretending that they cannot exist, and then adjusting to the facts the calculations based on this false assumption. Such fictions are everywhere practical necessities, and the philosopher who will not have recourse to them is like a politician who scorns to avail himself of "propaganda." On the enormous extension of this procedure, its indispensability and value, I need not, happily, enlarge; it will suffice to refer to Vaihinger's great study of the *Als Ob*, and to proceed at once to the task of showing how scientific procedure justifies the human hatred of Novelty.

Scientific procedure, as the more progressive logicians are now recognizing it to be, does (*in a sense*) rest on a negation of Novelty. It "explains" the new, that is, the object of its inquiry, by taking it as a "case" of the old, whether "law" or "object." It thus refers it to something already known, and assumes that it is "essentially" the same, and may be treated

accordingly. It is plain, however, that in this proceeding its novelty evaporates. It is taken to be irrelevant to its "essence," to be "immaterial," if not unreal. In other words, it is abstracted from, even if not denied outright, and it is by this abstraction that the new is triumphantly reduced to the old.

Now what right have we to do this? Certainly none that flows from the duty of correct or complete description. A vital feature of the actual fact is arbitrarily excised and deliberately ignored. Can we rest our claim, then, on a necessity of thought? It is an easy and easy-going habit of ours to bolster up our desires by alleging necessities, the tyrant's plea in philosophy as in politics. But here this plea is manifestly false. For we recognize the existence of Novelty even in the act of abstracting from it: our "case" is plainly a *new* case of the old. We are intellectually capable, then, of perceiving its actual character; it is *untrue* that we cannot think novelty.

The real truth is that we do not *want* to recognize it, and boycott it. Why? Because we do not want to take reality as it comes. We want to control it. We want to alter it. We want to adapt ourselves to it. We want to prepare for it. We want to connect it with our desires and aims. Our cognitive processes, in short, are part and parcel of our vital purposes, and are only *intelligible* in this connexion. This is why we treat the actual fact in the high-handed way we do.

Now it is easy to see that to manipulate the new, to bend it, eventually, to our will, we must somehow get a hold on it. If it were wholly new, utterly unprecedented and unlike anything we had ever known, this would be impossible; we could not lay hold of it, we could do nothing with it, we could make nothing out of it. We *must* assume therefore that its nature is not thus intractable. We must explore it for points of likeness to something already known. We must test it by applying to it "laws" (old and approved formulas), and observe whether it will "obey," that is conform to, them. Of course we do not know in advance whether it will; but if it does not, we simply

try another formula, until we discover one that "works": the principle that there *must* be some way of coping with the new is methodological, and cannot be renounced. The actual hypothesis we use has always to be confirmed empirically by the event; but the principle that inspires our search for a "true" hypothesis is not empirical, but volitional, and drives us, when we have failed, to fresh experiments with other laws, other analogies, hypotheses and similarities. Thus do we grapple with the recalcitrant novelty, until it has been successfully placed in our intellectual cosmos, and we have triumphantly enrolled the intruder in the great army of precedents. Thus is the discrepant novelty tamed and reduced to order and conformity with the cosmic order, which in its turn stands as a pledge to us (of questionable value) that it will not be intractable.

This then is the reason why it is reasonable for scientific method to abstract from Novelty, in order to tame and humanize it; it is evident that it affords considerable excuse for human repugnance to the new as a disturber of the cosmic order, though hardly a justification for the insaner excesses of our conservatism. .

IV.

All this however is not the whole story, but only the conclusion of the first part. For once the new fact has been broken in and tamed and assimilated to the old order, science can, and indeed does, repent it of the violence done to it. It *undoes* therefore its abstraction from the novel features it had ignored, and proceeds to recognize the individuality of the "case," its differences from the cases previously on record, its unique significance, and the *additions* it makes to our knowledge. In so doing it revises its statement of the function of "laws." It admits that the "law" it applied was not a rigid instrument of absolute prediction, but a flexible formula to be adjusted to the facts, fitted with blanks that can be accommodated to the

variable circumstances of an infinity of "cases." Consequently it never necessitates, or justifies, *absolute* prediction, which would be possible only if the "variables" in the new cases were absolutely identical with those of the old; whereas the course of history can go on engendering novelties, without ever repeating itself. *But the novelties have become intelligible.*

Some sciences indeed go further. Biology, for example, under Darwinian inspiration, has actually devised an expedient for systematically apprehending Novelty. It attributes the origination of varieties, the source of supply for the differences to be sifted out for survival by natural selection, to "accidental variation." Accidental variation is thus made an essential factor in its scheme of explanation, in fact a "category," as good as most. And yet what is it but creative chance? It is a mere re-statement of the fact of Novelty, and its whole value lies in its recognition of this fact.

It does not follow, therefore, that scientific method refuses to recognize the new as such, and really reduces it to the old, and makes an end of it. The methodological procedure which seemed to do this was a *fiction*, and only a preliminary to the proper placing of the new, and to an evaluation of its contribution to our growing world, and our growing knowledge. The abstraction from Novelty, then, can, and must, be undone, and does *not* incapacitate our thought from recognizing Novelty. In short, for science, the negation of Novelty is only provisional and methodological: it does *not* justify our human hatred of Novelty and the denials and disguises of Novelty to which this hatred goads us.

V.

Our concern so far has been with Novelty *überhaupt*, with its existence as a fact, and its conceivability as such. My endeavour has been to show both that Novelty exists, that it is conceivable, and scientifically manageable, and that our prejudice against it, though natural enough, both can, and should, be overcome. Let me next try to draw out some of the

consequences which the recognition of Novelty carries for some of the philosophic sciences.

I will begin with Logic rather than with Metaphysics, because, though metaphysics are just now multiplying far too freely and we have far too many of them, without logic they are like plants without roots, and can at best lead a saprophytic existence.

Logic, however, in spite of its fundamental position, is at present very much of a science in distress. Most philosophers have either despaired of it, or else made it into an impenetrable mystery. I cannot approve of either attitude: both seem to me to be wrong, and indeed, for my purposes, practically coincident. Both, moreover, seem to spring from one and the same blunder, an obstinate and inveterate refusal to recognize Novelty, really and fully, in Logic, as elsewhere. Once we consent to do this, there is no reason either for mystery or for despair. Novelty is as vital to Logic as to every science that is concerned with life, occurs in it as plainly and inevitably as anywhere else, and is explicable in it in a perfectly simple and natural way.

We can easily understand how novelty gets into logic, if we will deign to observe that Logic is a failure if it cannot deal with actual human thought, that every train of thought is purposive, and that logical processes can only occur in trains of thought. Hence they only occur when a thinker believes that by reasoning he can achieve some cognitive aim, and get to something he does not yet possess; that is, can attain *new* truth ("new," perhaps to all or "to science," but at any rate to *him*) or impart truth familiar to him to others, to whom it will be "new," and will convey instruction. Unless one of these conditions is fulfilled, there will not normally be any thinking or reasoning; consequently there will not be produced any material for logic to evaluate. "*Novelty or nullity*" is the first law of Thought, if Thought is not to be divorced from thinking, and Reason from reasoning.

This truth should not be hidden from us by the fact that

a good deal of futile and superfluous thinking may go on. An inquirer may laboriously "discover" what is not new but old. An instructor may teach what is no news to his hearers. All men make mistakes. But if the result of a thought-process is not new, the process was superfluous; while a reasoner who habitually tells us nothing we did not know before is merely a bore.

It is plain, therefore, that if logical process is to be in any real sense rational, it must conduce and conduct to novelty, and that a theory of logical proof which leaves no room for novelty cannot be right. It is fatuity, or at best verbal trifling. Yet it is an astonishing fact that 2000 years of logical reflexion have left logic impotent to account for novelty in thought, even though a sort of recognition of it was from the first involved in Aristotle's demand that the conclusion must prove something "other" than what was stated in the premisses. This postulate, in Aristotle's eyes, would perhaps have been satisfied by any verbal variant; still it does not get Logic out of the absurd position of being unable to "prove" the truth of anything new, or to admit the novelty of anything true. This absurdity has now lasted for well over 2000 years, and Logic shows little desire to extricate itself from a muddle that seems to be essential to its claim to "formal validity."

The reason for this embarrassment is merely that logicians *have* divorced reason from reasoning. They have chosen to imagine an "ideal" of Reason so high and holy that it excludes human reasoning altogether, and renders it unintelligible and impossible. They have become so enamoured of it that not even the discovery that they had inadvertently reduced their own ideal "forms of proof," the "syllogism" and the "system," to unmeaning nonsense has been able to deter them. Yet a child can see that there must be something wrong with a form of reasoning which only "proves" what has already been ascertained otherwise, or else assumes the very point it pretends to prove. This flaw in the syllogism has often been "discovered,"

and never been met; yet it remains "new" enough to be repeated once more.

(1) If in a syllogism the major premiss is "taken in extension," it is manifestly false if, in asserting that *all men are mortal*, no provision has been made for immortals like Tithonus, Elijah, the Struldbrugs and the Wandering Jew: while if these cases have been proved mythical, what novelty, or point, can there be in re-asserting the mortality of *one* of the cases already examined before the major premiss could be formulated?

(2) If we do not wish either to deny that certain "men" have miraculously evaded death or to sacrifice our major premiss to these exceptions, it is easy to take it as a definition, and so to exclude Elijah, Tithonus and Co. from the class of "men." But, if so, has it not become a tautology that *all men are mortal*, and what novelty can the conclusion convey?

(3) If, lastly, we try to take the major premiss in intension, as a statement of a "law of nature," we speedily come upon the same dilemma as before. We have merely to raise the question whether the "case" to which we are arguing in the conclusion is really *a case in point*. For it is by no means certain in advance that the "law" we are trying to apply is the right one to use upon the "case," that the case is "a case in point" and not a deceptive imitation; or that, though a good enough case in a general way, it is therefore a case for the special purpose of our argument. If we assume all this, we shall be *assuming* the very point to be *proved*; while if we *are* in a position to know that ours *is* a case in point, our conclusion will once more have failed to attain to novelty.*

And yet if reasoning brings out nothing new, why reason at all? If our premisses are already known to be as true as true can be before we use them, and if our conclusion is implicit in them, the syllogism seems a silly farce. It is a superfluity, unless it gets to something not otherwise accessible. And nothing but

* Cf. *Formal Logic*, ch. xvi.

an old logical prejudice prevents us from so taking it. It is perfectly possible to conceive this syllogism, *as it occurs in real thought*, and as alone it *can* occur therein, as a thought-experiment with reality which forecasts the course of events we are entitled to *expect* on the strength of past experience. But we do not know whether our expectation will be fulfilled. The rightness or wrongness of our anticipation is the news we learn from the event. If our conclusion comes true *in actual fact*, the reaction on our syllogism is to confirm our belief in its correctness and in the truth of its premisses; if not, we infer that there is some flaw in the premisses. Clearly on this interpretation the premisses *must* be taken as hypotheses whose truth is *not* assured; similarly the conclusion, though it *ought* to come true, and logically must *if* the premisses hold, need not happen in fact. When therefore it does come about, we learn something new, viz., that our premisses were so far true, and that logical reasoning has availed to predict the actual course of events. Of course this interpretation implies, what non-syllogistic reasoning openly avows, that reasoning does *not* start from certainty but from doubt, and reaches not *absoluteness* but, at best, *adequacy* to the actual problem considered. It means also that the attempt to abstract from the psychological side of reasoning is wrong in principle, and must be abandoned. And why resent this? For why should it be denied that every thought requires a thinker, and every thinker needs a motive? The need for Novelty then establishes itself even in the interpretation of the Syllogism.*

VI.

Logic, then, not only pronounces a *nihil obstat* upon the need for Novelty, but in passing it on to Metaphysics associates itself with the demand. Metaphysics however has plenty of

* The ideal of "system" must accommodate itself similarly. For if the system is conceived as "closed" and impervious to novelty, it becomes a fallacious "argument in a circle." Cf. my paper in last year's *Proceedings*.

prejudices of its own. It has long been accustomed to take it for granted that ultimately Being must be a constant quantity, and relied on the absolute truth and self-evidence of the venerable maxim *Ex nihilo nihil, in nihilum nil posse reverti*. If anything seems to arise or to pass away, this must be an illusion; or else whatever behaves in so inconsiderate and inconceivable a way cannot be truly real. For that which truly *is* cannot grow less or more. Nor can Being really change in any way. For change is Becoming, and Becoming is unthinkable. It is an impossible union of Being and Not-Being, and Being cannot but be, while Not-Being cannot be at all.

Has not all this a familiar sound? Has it not imposed on us all at some time? Yet it is only a string of methodological principles masquerading as absolute necessities of thought. If we were really resolved to consider the matter dispassionately and without prejudice, should we not soon discover that in itself the bare notion of Being assures us of nothing? We do not know that reality conforms to it. It contains no real guarantee of its own eternity; for the mere fact that something now is (or *seems* to be) is no proof that it must also have been, and must endure for ever. The validity of the notion of Being is a hypothesis like any other, and its value has to be determined by its application to experience.

Similarly the quantitative constancy of Being cannot be assumed *a priori*. Abstractly *three* alternatives would seem to be equally conceivable. Either Being may be constant, or else it may progressively increase, or, again, diminish. The first hypothesis has the methodological advantage of being the simplest and easiest to work with; which is the reason why we always try it first, and cling to it, despite appearances to the contrary. For appearances not infrequently suggest the other alternatives, which intrinsically are quite as plausible, and empirically there is much to be said for them. Thus to all appearance psychic being tends to exemplify a law of increase; it progresses and grows richer, ampler and intenser as it

accumulates experience—until mental decay sets in. Physical being on the other hand tends for ever to evaporate. It is subject to a law of decay. The flow of change is ever downwards; mechanical nature seems to be running down like a gigantic clock. This is repugnant to our prejudice, so we insist that the physically real does not really pass away but “only” passes into an imperceptible form, not into nothingness. But when “matter” is dissolved into “energy” and energy is “dissipated” into “heat,” they are surely lost *to us*, and disappear as agents in our world. The explanations given by our physicists of this untoward process seem to be merely ways of concealing this loss, and of saving the face of the postulate of the constancy of Being. A similar self-deception has probably exaggerated the value of the empirical support of this dogma; certainly recent discoveries have done much to discredit its validity. We now know that the ordinary chemical experiments to prove the “indestructibility of matter” were not nearly fine enough. The chemical “atom” is by no means the ultimate and stable structure it was taken to be; wherever we can get to grips with it, we find that it is dissolving or disrupting, more or less slowly. Hence if we realize that the ordinary propositions of physics are statistical results concerning the behaviour of thousands of millions of the constituents of “matter,” and are willing to suppose that atoms form an approximately stationary and stable population, there is nothing in the chemical facts to confute the suggestion that atoms, like men, may be generated and destroyed.

The empirical aspect of the world, then, is quite compatible with the falsity of the maxim that nothing arises out of nothing; or rather it seems to hold of some things, or up to a point, and not of others. Of the others some appear to arise out of nothing, and others to pass away into nothingness. These appearances *may* be illusions, but Metaphysics is hardly entitled to assume this, and the presumptions of a cheap monism should not deter us from investigating them.

Metaphysics should rather consider carefully whether it is not bound to declare that in principle Novelty, wherever it occurs, must necessarily be conceived as arising out of nothing; so that if Novelty is real, origination out of nothing, so far from being an impossible paradox, would be about the commonest and most familiar process in nature. The argument for this contention might be worded thus—It is true that nothing ever arises out of absolutely nothing. There is always something out of which it grows. But that does not explain it wholly. It does not account for the *new* in it. It is only in so far as it is still the old, or the old over again, that it is accounted for by what it grew out of. In so far as it is new, it remains unaccountable, unpredictable, uncontrolled, undetermined, free. *That* factor in it, therefore, *has* arisen out of nothing, and Novelty as such *means*, Creation out of nothing!

In view of the length of this paper I will abstain from criticizing this argument and remark merely that it may be true. After all we do not always succeed in forcing our postulates upon reality: so after all our world may be such a world as it appears to be, a world in which being is *not* constant and stable, and time and change are real, and devour what they have engendered.

VII.

I come at length to my last theme, viz., the import of Novelty for Religion, a theme on which I can only throw out a few hints. Religion is perhaps the most paradoxical of human institutions, in which all the contradictions of human nature are embraced and concentrated. For at one and the same time it seems to be morally the embodiment of all man's highest aspirations and the asylum for his maddest and most brutal superstitions, politically the most conservative and most revolutionary of social forces, intellectually the creation of his crudest and his subtlest thought, practically his final effort to transcend the limits of his being and yet the supreme support conditioning

his life within them. Its relation to theology is no less paradoxical. At first sight theology seems a mere excrescence on religion, devised to amuse the leisure of idle priests; and yet religions all generate theologies, and theologies not infrequently have lessons for philosophy.

So here. We have slowly forced our way to a point where a theological doctrine has all the appearance of a saving revelation. Originally the doctrine of the world's creation out of nothing was bound to seem mere philosophic foolishness. It was a denial of "out of nothing nothing." It had a most discreditable history. It arose out of sectarian zeal, and a blunder of translation. Philo of Alexandria invented it in order to prove that the God of *Genesis* was superior to the God of the *Timaeus*. The Platonic "myth" had pictured the latter as forming the (sensible) world out of empty space, and as having as his models the eternal "Ideas": so Philo thought he could go one better by declaring that *his* God created the world out of nothing. He supported his contention by mis-translating the first chapter of *Genesis*, which was really a Jewish adaptation of Babylonian myths describing how Bel, the Sun-god, slew Tiamat, the Dragon of the Deep, or Ea, the Fish-god, fished the earth out of the waters of the "Abyss." A correct translation would have brought out the fact that in the Hebrew version also these "waters" were a presupposition of "creation," and that the God of Moses also made the cosmic order out of chaos, and not out of nothing.*

It was a further difficulty about the notion of creation out of nothing that most languages refused to recognize it, and had not evolved the means of expressing it at all. It had not occurred to their makers to distinguish between *making* or *shaping*, out of pre-existent material, and "creating" *de novo*. In French, for example, *créer* has to do duty for both these ideas. English and German are peculiar in making the

* Cf. C. M. Walsh, *The Doctrine of Creation*.

distinction, but even they exhibit the difficulty of making it, by specializing different words to express it. The English *create* originally meant to "generate," the German *schaffen* is the same word as our "shape."

Clearly the doctrine of creation out of nothing was in every respect in a precarious state, and it is a marvel that the Christian Church adopted it. Yet we have found that the Christian Church was right, and philosophy was wrong. A world that generates novelty is creating itself out of nothing. It must be pronounced capable of arising out of nothing; only we must add that the creative process is still continuing.

Moreover it is clear that this process has great religious value. A world of which the being is constant and fixed has one great and irremediable defect. It cannot change for the better, because it cannot really change at all. It is already, and for all time, and despite all appearances to the contrary, as good as it can be. Also as bad. It disappoints no expectations, but leaves no room for hope. *Tout est donné*. All the cards are on the table, and we can judge whether our hand is worth playing. We can therefore decide upon its value here and now, and take it or leave it. Whether we decide for it or against, approve of it or repudiate it, it has no halo of possibilities, of romance. It has no future. It is essentially "eternal," fore-doomed to be a "heaven" or a "hell" (as may be); and, in either case, a prison and a bore.

On the other hand, a world which is still "evolving," creating, and re-creating itself, has room for the realization of all ideals. It can become better, and even, conceivably, completely good. Thus there is no finality about its evils. Nor of course about the judgments passed upon it. We need never despair of it, if we do not despair of our good will and intelligence. For that it is becoming what it becomes may in part depend on what we will and what we do and how we determine its indeterminations. Some of the novelties it generates may be of our own invention!

But of course the choice between these two worlds will not be agreed upon alike by all. Some will prefer the one, others the other. The conservative will opt for the world whose evils are customary, known, and calculable. So will the pessimist, unless he really thinks he is living in the worst world possible. The optimist will prefer a world capable of betterment, because he instinctively hopes for the best and trusts that the sinister possibilities of deterioration will not be realized. The adventurous also will welcome a world that is more fun and promises novelties, and will trust themselves to cope with them.

In short this whole issue as to the ultimate validity of Novelty seems to resolve itself into a question of valuation. Two opposite valuations seem possible, both starting from the equation "Novelty = Creation."* If we approve of it, we shall value it as "divine," and shall say "Novelty = Creation = God." If we disapprove of it, and are keenly sensible of its fiendish insecurity, we shall have an equal right to declare that "Novelty = Creation = the Devil."

Between these alternative valuations each of us must choose. Each of us will choose the one that appeals more to him, the one more consonant with his nature and tastes, and no one can presume to dictate his choice. For values are not only facts themselves, but the ultimate determinants of all the "facts" we recognize, and so questions of valuation are the most ultimate of all. Hence differences in valuations are irreducible, and not amenable to coercion by logic or by fact. They attest man's ultimate control over his experience: whatever it may be, *he* has the last word, and even at his last gasp, like Prometheus agonizing on the rocks of Caucasus, he can defy Zeus, and pass his judgment on the world.

* Another interesting equation to investigate would be "Novelty = Miracle," and the interest of the religions in this is obvious. But limitations of space forbid me to follow out its consequences here.

*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1,
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II.—AN INDIAN DOCTRINE OF PERCEPTION AND ERROR.

By F. W. THOMAS.

§ 1. *Prefatory.*

It seems advisable to preface the discussion of the matter which I have in view with a short characterization of the system in which it arises. It is known as the Nyāya-Vaiseshika system, a combination of two originally independent schools, of which the one, the Nyāya, contributed the logical doctrines, and the other mainly ontological and physical theories. It may be described as scholastic, pluralist, realist and atomistic. It affirms a plurality of souls, which are all omnipresent and everlasting, a material world constructed of atoms, differing in kind through what is called speciality or ultimate differentia (*visesha*), real objects composed of these atoms, and a real time and space. It admits a deity, and as regards transmigration of souls, liberation by knowledge and so forth it is in agreement with the general Indian views.

The expositions usually commence with a list of categories, or classes of entities, of which seven are recognized, namely, substance, quality, action, universality, speciality, inherence and negation. The history of this classification is not known; the categories are not in any way deduced, and other possible categories, such as potency and similarity, are discussed: it is sometimes admitted that the list is indefinite and partly optional. The first six of the seven are qualified as positive. The first three are credited with "existence" (*sattā*), which is described as the *summum genus*. The recognition of a highest genus "existence" (denied by Aristotle) hardly calls for

explanation; but attention may be drawn to the manner in which it appears in the system. By some it was held that "existence" does not differ from "positivity" and therefore should include the universals: accordingly they deny it as a genus. That, however, was not the orthodox view. An argument was drawn to the effect that "existence" is required to account for loss of existence: that in virtue of which substances, qualities and actions can cease to be is "existence." An attempt is made to show that this is not incompatible with the recognition of eternal "existents," such as atoms, time, space and souls; in fact the Indian logician argues that, whereas existence is something occurring in both eternal and non-eternals, the possibility of the latter occurrence is something which qualifies it even in the former. This is consonant with his usual procedure in defining genera; but in the case of "existence" he plainly has the special object of distinguishing *physical* existence.

The epistemology deals first with "truth" (*pramā*), the subject of various definitions, which all describe it as an experience: we might therefore call it knowledge. The means to truth (*pramānas*) are most commonly considered to be four in number, namely perception, inference, analogy and communication, of which, however, the last two are admitted to be dependent upon the second. The property of being means to truth is their validity (*prāmānya*), which term is also applied to individual true cognitions. All four are distinguished, as being "experience" (*anubhava*), from memory.

§ 2. Perception.

According to the old definition perception was "cognition arising from contact of sense-organ and thing, inexpressible and unerring, consisting of affirmation." In order however to include "God's perception," and also for other reasons, preference was subsequently given to a definition in the form "cognition not instrumented by cognition"; and it was

explained that inference, analogy and communication are excluded as being instrumented by cognitions of subsumption, similarity and meaning respectively. If we inquire why a definition based upon an enumeration of the sense-organs is not preferred, the reason, apart from the case of "God's perception," will be that the definitions of the sense-organs are made to depend upon that of perception.

The sense-organs are the five usually recognized, namely eye, ear, skin, tongue, nose, and also a sixth, which is called the mind-organ (*manas*). What is the purport of this addition? In the first place, it was held necessary to posit an organ which should report occurrences in the soul, such as desires, feelings and so on, i.e., should account for our awareness of these, since plainly they are cognized. It was quite in accordance with the system, which rejects "self-luminosity," to bring cognitions also under this rubric. As a result, we have three kinds of procedures in the soul, namely cognitions, desires and feelings, which are brought to consciousness by a single organ. Consciousness, however, is not the best word to be used in this connexion. For plainly the idea is in exact correspondence with that which Professor Ward expresses by the term "attention." Some philosophers explained the varying area of attention by a power of contraction and expansion in this mind-organ. But the orthodox view regards the organ as atomic. Its second function was to account for the fact that, while all the senses are in contact with the world, we attend to them severally.

As regards the objects apprehended by the exterior senses, we may cite a brief statement from a manual,* as follows:—

"The field of smell is odour, also odourness and so forth.

"Similarly savour [is the field] of the tongue, and sound of the ear.

* *Siddhānta-muktāvalī*, 53-7.

"The field of the eye is appreciable colour. Substances possessing the same, severalty and number, disjunction and conjunction, priority and posteriority, viscosity, fluidity and size, action and genus in appropriate occurrence, inherence under the same condition the eye apprehends through connexion with light and appreciable colour.

"Substance having appreciable touch and appreciable touch itself are the field of the skin; also what is suitable for being seen, except colour. Here also colour is the cause of perception of substance."

The gist of this is that smell and taste reveal only qualities and their genera, whereas sight and touch reveal also substance, action and so forth. Accordingly we should understand that, when we taste a thing, there is a combination of two senses, taste and touch: an apparently reasonable view.

What may be the correct doctrine as regards seeing substances, i.e., things, through connexion with light and colour, I am not prepared to state. But at any rate it is a *prima facie* experience that we see not only colour, but also extension, and that may be enough; moreover, a joint prerogative of sight and touch over the other senses is in this respect, I believe, conceded. The curious doctrine that colour is cause of the actual perception of substance is one which we might be shy of mentioning. It was due to a desire for a single cause of such perception, and was connected with a view that air is known not by perception, but by inference. We need hardly mention that it is as cause and not as object of perception generally that "colour" was selected by these realists. The doctrine was criticized and rejected by the "moderns."

We will not go into the physical explanations of vision, or what in the case of sight is understood by "conjunction with the eye and light," or what is stated in this connexion as to action at a distance. Sufficient has been said to show that in their treatment of perception these Indian philosophers were at

least on a level with the Greeks and with the scholastics of our own middle ages. They even attained the notion that all perception and cognition were due to a connexion of intelligence with a skin, a notion, which seems to be endorsed by modern science. What is known as the "relativity" of perception in the case of such pairs "long" and "short" was also considered and by some denied,* as we may also find in modern psychological works.

§ 3. *Process and Analysis of Perception.*

As a practical exemplification of the stages recognized by Indians in the process of perception we may quote a particular (Jain) statement† as follows :—

"Originating with a seeing, which occurs immediately upon conjunction of object and subject and which takes in existence only, we have a first apprehension of a thing qualified by intermediate generic forms—this is 'notice.'

"Next comes desire for the speciality of the thing noticed—this is 'curiosity.'

"Next, ascertainment of the speciality of the object of the curiosity—this is 'apperception.'

"The same, when it has attained a confirmed condition, is 'retention' or 'contemplation.'

"From curiosity 'doubt' is distinguished by being preceded thereby.

"Although all these are in a way the same, they have different designations in virtue of being special developments.

"Owing to being experienced without confusion, even when they occur in incomplete form, owing to their revealing severally unanticipated developments of the

* *Tattva-cintāmaṇi*, Vol. I, p. 560.

† *Pramāṇa-naya-tattva-āloka-ālukāra*, II, 7-18.

thing, and owing to their successive origination, these overpass each other.

"In some cases the succession is unobserved by reason of rapid origination."

The Nyāya-Vaiśeṣika philosophy is usually content for its purposes to distinguish in perception two stages, which I will represent by the terms "unquestioning" (*nirvikalpaka*) and "definitive" (*savikalpaka*). The literal meanings "without alternative" and "with alternative," while indicating the nature of the distinction, are unsuitable for use, and for the second there is a synonymous term *vyavasāya* (apperception) which is rather literally rendered by "decision." This important discrimination will justify a rather extensive quotation* :—

"Immediately upon conjunction with the eye there does not arise a cognition in the form 'pot,' as a something qualified by 'potness,' by reason of the previous non-existence of the qualification 'potness'; for the cause of awareness of a qualified cognition is cognition of a qualification. And so at first there comes to pass a cognition not penetrating to a being qualified as between pot and potness; and it is this that is the 'unquestioning.' And this not perceived. For a cognition not penetrating to a being qualified is not perception, since that presents itself as 'I cognize a pot.' Here in the self a cognition comes to light by way of being a determination [thercof], in the cognition again 'pot,' and in the pot 'potness.' That which is the determination, the same is called a 'qualification'; in the qualification the further qualification is called the delimitant of the being that qualification. A cognition having for determination the delimitant of the being of a qualification is cause of the qualificand's being qualified. Now in the unquestioning a determination such as

* *Siddhānta-muktāvalī*, 58.

'potness' is wanting; hence in that cognition a glimpsing of the qualification of the pot, as qualified by potness, is not possible. Without the determination 'potness' there can be no cognition of what is qualified as 'pot,' because of the rule that cognition of a thing other than a genus is determined by some attribute."

The upshot of this is that there is in perception a stage at which the thing is indeed apprehended, but without discrimination of its "thisness" from its "essence," as the matter is elsewhere put. At that, the unquestioning, stage it is held that the cognition is really suprasensual and not subject to the alternative of truth and falsity. But what is the point of calling such a cognition suprasensual? What appears to be meant is not that the thing, but that the cognition is not perceived, *i.e.* by the mind-organ. In other words, we perceive, but do not perceive that we perceive. Furthermore, the cognition is infallible, so that error, if any, must come in, as the Epicureans held, with the *προσδοξαζόμενον*.

At the second, or definitive, stage we qualify the object by a generic term, recognizing that the pot is a pot. According to our system this implies a thinking of the genus itself, and we have to show how this comes about. In its realism the system demands that the genus must be there, in order to be thought; accordingly it is said to be apprehended by a non-mundane contact (*alaukika-sannikarsha*), which is designated *sāmānyalakṣhanā*, "having the generality for mark." Here again we may indulge in a quotation:—*

"Here, if by the word 'mark' self-identity is intended, we get the meaning, 'a presence of which the self-identity is an universal.' And this is to be understood as by way of a determination in a cognition having for object the thing connected with the sense-organ. Thus, where

conjoined with the sense-organ is smoke, and with that for object the cognition 'smoke' has come to pass, in that cognition there arises the determination 'smokeness,' and with contact *qua* 'smokeness' a cognition 'smoke' having for object all smokes.

"Conjunction with the sense-organ is to be understood as mundane (normal), and this in the case of exterior sense-organs. In the case of the mind-organ merely the universal by way of being a determination in the cognition is 'presence.' Hence, when by verbal communication and so forth we are made aware of some ghost, a mental awareness of all ghosts is accounted for.

"Furthermore, generality means 'being common' and that is in some cases eternal, 'smokeness' and so forth, in other cases non-eternal, 'pot' and so forth. Where a particular pot is cognized as being, by conjunction, on the ground or, by inherence, in its parts, thereupon there arises a cognition of all the grounds, or of all the parts, having that pot. 111930

* * * * *

"In perception nothing is presented without a contact; and so without 'generality-mark' how would there be a presentation of all smokes *qua* smoke and of all fires *qua* fire: this is why 'generality-mark' is accepted. Nor should it be asked what harm there is in non-presentation of all fires and smokes: for, inasmuch as in regard to the perceived smoke a connexion with fire has been apprehended and other smoke is not given, there is then no accounting for the doubt whether 'smoke' is overlapped by 'fire'; whereas on my view, since by 'generality-mark' all smoke is given, a doubt is possible as to whether 'smoke' at other times in other places is overlapped by 'fire.'"

We are now, perhaps, in a position to seize the whole

doctrine which is meant to be conveyed. According to this doctrine, what is first presented is a particular object in its undivided entirety. But in point of fact the object consists of an universal inherent in its material; and this universal emerges to the view of the soul, which has contact with it in a suprasensual manner. But the universal, as such, inheres equally in all particulars; and, since it has no existence except as inherent, all the particulars come in some way into contemplation. Even a particular may act as an universal in view of the different other objects to which it stands in the same relation.

There is, however, yet another factor of which we must take account. When we see a lump of sugar, we know that it is sweet, a fact which we explain by "association of ideas." The Nyāya (but not all other systems) will have it that we *perceive* the sugar to be sweet, and it admits another non-mundane contact under the name "cognition-mark" (*jñāna-lakṣaṇā*). Since, however, the object is clearly legitimate, namely, the distinction of the inherent universal from the associated, we need not quarrel with the way of putting the matter or discuss the arguments.

Probably the most interesting feature in the theory as so far expounded is its attitude to the universals, which it holds to be involved in the perception. It is not so long since in this Society we heard it maintained that the perception of a thing involves in a way a consciousness of all its congeners. Possibly, therefore, some further observations, partly from the Indian side, may be in point. The particular functioning as an universal has already come before us. But there is another Indian system, that of the Jains, which deals more formally with the subject. Here also we may make a quotation:—*

"Generality is of two kinds, crosswise generality and vertical generality.

* *Pramāṇa-naya-tatva-śloka-tilakāra*, V, 3-5.

"Crosswise generality is a similar development in several particulars ; for example, 'ox-ness,' in bodies spotted and brindled.

"Vertical generality is substance common to prior and posterior developments ; for example, 'gold,' persisting in 'armlet,' 'ring,' and so forth."

In thus discriminating two kinds of universal, of which one depends upon difference of individual and the other upon difference of time, the Jains would seem to have the support of a passage in Mr. Bradley's *Logic* (I, c. VI, §§ 30 *sqq.*). But the Vaiseshika tenet seems to regard the individual even in its single occurrence as an universal, since it stands in various spatial relations. This, however, does not go for much, because their view was clearly that what is perceived is a particular, constituted by an universal inherent in certain matter.

Perhaps in this connexion I may venture to dwell upon a consideration which is certainly apposite. How far are we constituted capable of apprehending the strictly individual at all? May it not be said that the sense-organ always apprehends an universal, since it has no power of apprehending anything else? Just as a gun would impart precisely the same motion to every projectile having the same shape, size, and mass, and just as any other machine will function upon similar material to precisely similar effect, so the sense-organ is incapable of discriminating between precisely similar objects. We know, in fact, that beyond a certain degree of similarity it loses the power of distinguishing ; and, if it is argued that this is only a matter of a variable limit, and that the existence of two absolutely similar things is a disputable, or a false, hypothesis, we may reply that not the actuality, but the mere possibility of such similars suffices to enforce the lesson that what we perceive is not the inner self of the object, but a semblance which might recur elsewhere and is therefore in its nature an universal. On this view the particularizing factor

would be simply the junction of the two also general conditions "here" and "now."

What is ignored in this argumentation is the historical consideration? Can we not say that, failing other means, the history of the object gives a definite identification. Two cannon-balls may be as indistinguishable as we like; but they and their parts carry always theoretical, and probably physical, traces of the different situations in which they have taken a part. Even things which are actually classes may become, when we include the historical aspect, particulars: for example, man as a historical actuality is a single phenomenon. Upon this view the individual would be constituted by a crossing of two universals, one dependent upon similarity and the other upon temporal sequence, the cross and the vertical universals of the Jains. If it is rightly said that we are always dealing with a specious and not an absolute present, and that "iron" cannot in an atomic instant exist, it is clear that the time factor must always be included in the logical view. But plainly no combination of universals can ever yield more than a relative individuality; and, if we require the absolutely individual, we shall have to apply to the mystics. Or might it be said that after all there is some essential difference between the universal "Socrates" and the universal "man," namely, that we suppose "man" to be in some way definable, that is to be composed of a finite number of universals, whereas in regard to the individual we have a feeling that his essence is inexhaustible? But it is hardly to be expected that even this hypothesis would command assent; for, while it is clear that "man" need not imply any of the peculiarities which distinguish Socrates from Plato, we should have to deal with the view that "man" also is something of infinite potentialities, including those very idiosyncracies which distinguish Socrates and Plato.

I must not imply that the Indian logicians had discussed the matter in this light. In fact, they certainly did not do

so, but found in their atoms an absolute differentiation. But clearly the Jains, in admitting both a "crosswise" and a "vertical" generality, had taken a step which might ultimately render questionable the very idea of an individual. So far is it from being the fact, as has been alleged, that the Indians were unacquainted with the concept.

§ 4. *The Post-apperception (anu-vyavasthāya.)*

The completed perception results according to the Nyāya in a cognition of a "this" as qualified by a universal, the object being really qualified and the cognition correspondingly determined. But these philosophers recognized a further stage, at which the mind becomes by mental perception cognizant of its cognition. No doubt, their opponents in general admitted such a stage in thought. But there were essential differences as to its character and indispensability. Some philosophers held that the original cognition was suprasensual and inferred from a resultant "known-ness" in the object. But the main contention was with the upholders of "self-luminosity." These maintained that the cognition in itself without "post-apperception" was sufficient to lead to appropriate action; and to the objection that desire also should be similarly autonomous they replied that this was untrue, since for all action they posited cognition as a requisite. What they mean by "self-luminosity" is that all cognition implies consciousness, and some of them state their view formally as follows:—*

"The proof of self-luminosity is perception itself. For all presentations have at their origination the form 'I cognize this,' tracing out a cognizer, a cognition, and a cognized, wherein the self is glimpsed as agent, the cognized as object of the act, and the cognition as action :

* *Tattva-cintāmaṇi*, Vol. I, p. 788.

so that the cognition is experienced as including in its proper reference the cognizer and the cognized."

The point of the debate is, no doubt, a little obscure. What the opponent really maintains is that all cognitions are in the form of a revelation of their object to the subject and not susceptible of error: as the connexion between a cognition and its (true) object he names a "special kind of own nature," which he says is established by experience, although it cannot be conveyed by any single word. The Nyāya denies that all cognitions are in the form "I cognize this," and claims that experience proves that factual certitude in the form "this silver" is sufficient to elicit response. Both admit that the response may be mistaken; but, while the Nyāya holds that this is the fault of a wrong perception, the opponent considers that it is due to a failure to distinguish between the thing perceived and something desired.

§ 5. *Truth and Error.*

Coming now to the matter of truth and error, we may recall how anxiously the later schools of Greek philosophy were occupied with the question of the non-illusory perception. The whole dispute between the Stoics and the later Academy centred about this point. The Stoics laboured to define an appearance which could not deceive, their *καταληπτικὴ φαντασία*, and even appealed to the goodness of Providence, which would not have created two exactly similar things; while the Academy based upon the view that any appearance might be false its doctrine of the probable. At a much earlier period some of the Sophists denied the possibility of error on the ground that a false statement was simply a different statement, wherein, of course, they were considering merely the content of a judgment and ignoring the real question, which concerns its reference.

In the Nyāya-Vaisheshika view perception does, as we have

seen, apprehend a real object, and the process consists of a distinguishing therein a "this" and an universal and then attributing the latter again to the former. Inasmuch, however, as it admits that perception may be true or false, it has to explain what truth and falsity are, how they arise, and by what means the latter can be cured.

To the question "what is truth?" most Indian schools would reply that it is identical with true experience. An absolute truth independent of experience does not seem to be contemplated; and if it were asked what is the truth of the statement "Cæsar is dead," apart from anyone's experience of it, they would probably reply that it was a factual coexistence of what is denoted by "Cæsar" with what is denoted by "dying," namely Cæsar's factual death.

Within the experience doctrine there were, apart from the extreme position of those who held that all experiences are true, many varieties of definition, some of which are set forth by an opponent and refuted as follows:—*

"Truth is not experience corresponding to fact. For similarity, which is the meaning of the word "corresponding," does not hold between a cognition and a pot and so on; and moreover mere similarity has to be set aside in treating of error.

"Nor is it experience generated by a quality or experience generated by negation of defect, since these two are not invariants, and since they themselves require to be de-marked by 'truth' and 'untruth.'

"Nor is it unprecluded experience, since preclusion is truth of contradictory.

"Nor is it consonant experience, since being 'consonant,' which is being accordantly traced out by another cognition, is common to error.

"Nor is it experience generative of accordant response, since this does not comprehend truth which is indifferent and since the accordance requires to be demarked by 'truth.'

"Nor is it experience of a 'that,' since of what is nothing there is no presentation, and, if there were, the same would apply to error."

The disputant goes on to refute the view of those who hold that all objects are such in virtue of an 'objectivity,' and that particular objects have particular "objectivities," which leads to the theory that truth is an experience having a determination coinciding with the particular "objectivity."*

Among these varieties of opinion we may find some adumbration of what we should recognize as a correspondence doctrine, a pragmatist doctrine, and a consistency doctrine. The Nyāya replies with its own definition, as follows :†—

"Truth is experience of a thing where it is, or experience with determination A applied to what possesses A."

"Error is cognition of a thing where it is not, or cognition with determination A applied to what does not possess A."

"Or else truth is experience, given a being other than error as so defined.

"And 'having for determination A' is 'having for object a being qualified by A,' or a 'being generated by a cognition of qualification A.'"

* This, perhaps, requires a little elucidation. If, it is said, we cognize another person's cognition and also its object, *e.g.*, a pot, we may still doubt whether he cognizes it *qua* "pot": it may be presented to him under some other aspect, *e.g.*, missile. Accordingly, we suppose that a thing has some proper, or correct, aspect in presentation, and this is its "objectivity" or value as an object. Each thing has its objectivity, and in cases where this is realized we have truth of perception.

† *Tattva-cintāmaṇi*, Vol. I, pp. 401-2.

The purport of this definition is to recognize in the thought and the thing an element not merely of correspondence, but of identity. This the Nyāya finds in its universal. It argues that the concept "earth" undeniably has a content, or determination, "earthness"; and, holding that "earthness" is really existent in all "earth," it is entitled to frame its definition in the stated form. We may say that its method consists in discovering a content which cannot be distinguished from its actuality; and it formally asserts that both perception and conception are contacts with a reality. I should like to ask whether from their point of view these systematists were not justified. Once admit that in the thought of a universal it is possible to distinguish content and act, then the content must have some sort of independent existence (which may indeed sometimes be nothing more than a having been thought by some one on some other occasion); and, if the universal is applicable to the perceived particular, then economy demands that the existence in conception should be the same as the existence in perception, and we have a fundamental identity either of things conceived and things perceived or of the corresponding operations. It is only if the contents are entirely under our control in thought that it seems possible to import them into perceptibles to which they are initially extrinsic. Other Indian systems, which admit a form of existence called "conventional," would elude this argument; and perhaps the philosophy of language would also regard the universal contents as having a conventional existence.

As regards error of perception also the Nyāya has to deal with various opponents. Its own doctrine is that error is mistake. When I perceive mother-of-pearl as silver, what happens is that an independently presented cognition of silver associates itself with the perception, which is thereby falsified. What is insisted upon is that the concept of silver qualifies the object perceived in precisely the same way as would in true

perception the concept "mother of pearl"; and a syllogism is drawn up as follows* :—

"A cognition having for determination 'silverness' and begetting response due to wish for silver and applied to mother-of-pearl qualifies the mother-of-pearl, because it is cognition entailing response to the mother-of-pearl; like the cognition begetting response to mother-of-pearl by one requiring mother-of-pearl."

The opponent admits that the idea of silver is present by way of recollection or association, but denies the qualification. He holds that the perception of the thing and the remembrance of the silver are present in the mind together and that the wrong response is due to a negative something, namely a non-apprehension of difference between the two. We have here material for a pretty discussion, in which the case of silver and mother-of-pearl together mistaken for mother-of-pearl and silver together plays a prominent part. The strong point of the opponent is that his non-apprehension of difference accounts for the response in the case of true perception of silver as silver. In reality, however, he does not admit error of perception at all; and in fact he openly asserts that all cognitions are in accordance with fact, and that they can be made to appear false only in practice; whereas the Nyāya-Vaisheshika endeavours to get the error into the actual perception, and finds an analogy in recognition, which he explains as experience of "thatness" in the perception itself.

Another consideration urged by the Nyāya-Vaisheshika disputant is based upon the doctrine of the "second intention" (*anu-vyavasāya*), wherein the percipient becomes aware of his perception. If, he says, the original perception were not infected by, but only associated with, a false idea, then the second intention would be in the form "I cognize this and

* *Tattva-cintāmaṇi*, Vol. I, p. 443.

silver," whereas it is really in the form "I cognize this as silver," or rather, "I cognize a present thing as 'this' and as 'silver,'" since in the second intention the original object can appear only *via* the original cognition.

Truth and error being as defined, their causes have next to be examined, and they are stated as "quality" and "vice" (or "defect") respectively. Neither of these, however, is regarded as a genus; each is a manifold established separately by induction.*

"For truth universally there is not a single invariant 'quality': rather have we for such and such truths respective qualities, *e.g.* [in perception] contact of the sense-organ with more parts of the object, [in inference] cognition of a real mark, [in analogy] cognition of similarity, [in communication] cognition of meaning, all as established by concomitance and divergence. In the case of such and such untruth, where we have perception infected by the vices of [distance], bile [as when we see a white shell as yellow] and so forth, error as to mark, etc., seeing of a differentia is also quality, since the result confirms it."

Closely connected with the question of the causation of truth in perception is that of its mediacy or immediacy. Among the upholders of immediacy there are beside those who maintain that all cognitions are true some who consider that it is something produced by the cognition-producing apparatus, some who consider that it is produced by an additional factor and some who held that is a special "knownness" or qualification in the cognition. And they all urge against the mediacy doctrine the objection of *regressus ad infinitum*. The Nyāya-Vaisesika replies as follows†:—

* *Tattva-cintāmaṇi*, Vol. I, p. 327.

† *Siddhānta-muktāvalī*, 135.

"If the truth of a cognition were self apprehended, then in regard to a cognition at the non-recurrence stage there would not be doubt. For then, if the cognition is cognized, its validity also is cognized, while if the cognition is not cognized, then, as the thing to be doubted is not cognized, how can there be doubt? Hence the validity of a cognition is matter of inference. Thus: 'This cognition is truth, because it gives rise to accordant response; what is not so, does not do so.' 'This cognition having the determination 'earth-ness' is truth, because it is cognition with determination 'earthness' applied to what has odour. Nor should it be asked whence comes the cognition of the middle. For the having the determination 'earthness' is self-apprehended, and, as odour is apprehended of that, the application to the thing having odour is obvious. Nor should it be asked how the major 'being truth,' is known beforehand; for in the cognition 'this' a being truth is self-apprehended."

As regards the *regressus ad infinitum* it is observed that we come sooner or later to a certitude of which invalidity is not apprehended; we do not entertain doubt of everything and that is enough. Accordingly the view is that validity is matter for inference, that we go back as far as there is doubt, and that ultimately there are cognitions, such as the cognition "this," of which the truth is self-evident.

On the whole it would appear that in the view of all these disputants there is a stage (in the Nyāya-Vaiśeṣika system the "unquestioning") in perception which is not susceptible of error. They differ as to its character and discuss whether it is known to consciousness and in what manner error creeps in. In cases such as that of the distant "stump" or "man" some admitted a perceptual doubt, just as in the case of conflicting middles some posited an "inference of doubt." But the Nyāya denies that the "apparatus of doubt" exists prior to the

perceptual judgment; and clearly perceptual doubt must be due to imperfection somewhere, unless we are prepared to admit the actual existence of "doubtful" objects which can develop upon inspection into either "posts" or "men."

The scholastic character of these discussions is apparent. What I should like to inquire of the Aristotelian Society is how far they bear upon the real problems. It seems that modern psychology admits in perception a large representational element. If I take for a horse something in the distance which turns out to be a cow, presumably the "horse" part is representational. But much more is ultimately representational and the ultimate presentational element may be merely a dark patch in a field. Apparently every element may be illusory, and more particularly the last, which may be a spot on the eye or some defect in the visual apparatus. If truth of perception were normality with reference either to the individual or the race or (by aid of a proportion) to all percipients, then normal illusions would be true (perhaps they are?); while, if it is verification, the "seeing of more parts" and so on, the process may require an indefinite stretch of time, in some cases ages, and truth becomes relative or an ideal, although through "seeing of a differentia" many errors may successively receive their quietus. However, verification, combined with the notion of a content, seems to imply something more than consistency of appearances; for, if the awareness is a simple factor, invariant in all the appearances, the consistency must be on the side of the content, and this consistency would signify a "being" in the thing.

*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1,
on December 5th, 1921, at 8 P.M.*

III.—ON THE LIMITATIONS OF A KNOWLEDGE OF NATURE.

By JAMES JOHNSTONE.

SOMETIME about the beginning of the eighteenth century, and during the last ten years of his lifetime, Newton spoke to a friend about his work: "I know not," he said, "how it may seem to the world but, as to myself, I seem to have been only as a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me." These words, I take it, were, in a way, an admission of cessation of individual effort. By reason of his resolute and disciplined imagination, his genius for experiment and the mighty mathematical weapons that he had made, Newton had found a way. He thought about truth as lying there, spread out, so to speak, and waiting to be discovered and the means whereby that discovery was to be made were known to him. He knew that what he had found was only an infinitesimal part of all that was accessible by application of his methods. But there is only so much dynamic mental quality in any man, a little more or a little less as we vary from each other, and this can be "intended" to the investigation of nature, the pursuit of pleasure or the acquisition of wealth, and it can be exhausted. In little over forty years Newton, like his great predecessor, Descartes, had spent his creative energy, and the undiscovered, but discoverable ocean of truth was still there.

By the time that these words were spoken the course that physical and natural science was to follow during the next century and half had already been marked out by three great men: Galileo, to an extent which has only been appreciated by

some of us as the result of the relativity discussions of the last few years ; Descartes, by the exercise of an "inventiveness" which, as Clerk Maxwell said, "knew no bounds" ; and Newton himself, who had found the way. Throughout that century and half one seems to trace little or no really creative scientific thought but only a successful working out of the great ideas of the seventeenth century. From these came our conceptions of matter, inertia and force ; the laws of motion ; the theory of universal gravitation ; the description of the Solar system ; the notion of the ether as the locus and substance of physical change ; the ideas of illimitable space and uniformly flowing infinite time ; the Cartesian mechanism of life and the restricted theory of relativity. About the middle of the nineteenth century new ideas did come : perhaps the notion of natural selection was really new—I do not know—perhaps we had in that idea, the first clear distinction between statistical and individual results—a distinction that does not yet seem fully to be realized and employed in biological science. And then, a little later, we had from the mathematical investigators, of whom J. Clerk Maxwell is the type, the germinal work that was to bring about a revolution in knowledge.

Throughout those two centuries scientific men employed the inventions of Galileo, Descartes and Newton. Physics and natural science (which has always clung to the skirts of physics) explored the seashore, described and catalogued the pebbles and shells and now and then ventured out on the ocean. The eighteenth and nineteenth centuries elaborated the methods of the seventeenth, employing them in ways that were certainly unanticipated by Descartes and Newton—one wonders what the great French philosopher would have thought about the modern mechanistic conception of life, as it has been stated by Jacques Loeb ! It has been noted that as the methods of the seventeenth century became exhausted so did the materialistic science of the nineteenth seem to approach

finality and tend to become complete and rounded-off, in a sense. Perhaps one may be quite wrong but it does appear as if the natural science of the latter third of the last century regarded its framework as sound and entirely satisfactory and one gets suggestions of that kind from some of Huxley's essays. What was the good of quarrelling about the unknowable? The speculative game was drawn and what was left for Science was the work of strengthening the framework and filling in the details.

Perhaps this hard nineteenth century materialism had its work to do in the evolution of social and political liberty. It had to assert itself as a way of interpreting the meaning of the "passage of nature" and of searching out the origin and destiny of man. Medieval doctrines of social and economic privilege had to be destroyed. Perhaps that work is not yet fully accomplished and while that is so science will remain materialistic. There is still a fraudulent and grotesque spiritualism to be detected; a muddled vitalism to be replaced by something sounder and a prematurely formulated "Eugenics," that may be utilized to maintain caste and social disability, to be sifted clear from humbug. We may leave materialistic biology to these tasks.

Two centuries later than Newton a modern thinker,* writing while a revolution in scientific thought was being effected, refers to "the passage of nature which is only another name for the creative force of existence." "This operative presence" he says, "which is now urging nature forward must be sought for throughout the whole, in the remotest past as well as in the narrowest breadth of any present duration. Perhaps also in the unrealized future. Perhaps also in the future which might be, as well as in the future which will be. It is impossible to

* A. N. Whitehead, in *The Concept of Nature*, Cambridge University Press, 1920, p. 73.

meditate on time and the mystery of the creative passage of nature without an overwhelming emotion at the limitations of human intelligence."

I place this saying over against the well-known words of Newton because the two utterances illustrate very well the change in our attitude towards what is meant by scientific discovery. But I must make it clear what I mean by the "passage of nature" because this is a notion far less subtle than that indicated by Mr. Whitehead. And I think that a candid and impartial survey of the speculative biology of the late nineteenth and twentieth centuries must force one to the recognition of a *twofold* passage of nature. Perhaps this is indicated even in Huxley's contrast of the cosmic and ethical processes but it is expressed, with the utmost clearness, in Bergson's vital impetus as opposed to the tendency of matter to pass into the inert condition. I take it that the fundamental concept of physical science is the second law of energetics—the universal augmentation of entropy—and I assume (though it is difficult to be sure) that nothing in the most modern results of mathematical relativity tends, in the least, to weaken this great conception. Nature, then, has direction, or passage, which is such that all that we recognize as physical change tends continually to diminution: the Universe, regarded as a physical mechanism is one that is running down, or in Bergson's term, *détendant*. This is the one aspect of the passage of nature.

To the biologist, however, it can only be one aspect. I am well aware that the entropy-increase law is a statistical one and that it can only hold true for organic entities which are above certain limiting magnitudes: for Maxwell's demons the law would have a double sign and the entropy of an isolated system would increase or decrease with equal probability. The biologist must recognize that, even in organic systems, entropy tends always towards augmentation but surely he misunderstands the meanings of reproduction and adaptation if he does not see that what he calls life is the incessant attempt of certain

physico-chemical systems that we call organisms to resist the increase of entropy. There is, therefore, a passage of nature which is not that tending to inert-materiality (that is, to statistical inertia) but which is the opposite to this passage and is what one must understand by life in the physical sense. I am not sure whether we ought to insist on this two-fold passage of nature or, perhaps, regard it as a double aspect, in some way or other, of the same condition. Is life something that resists the passage of inorganic nature, or is inorganic nature already inert and extended, while living systems pass through it? Perhaps one inclines to think about a two-fold passage because of some mental constraint that tends always to a dualism of one kind or another.

I suppose that biologists must accept the main result of generalized relativity: "the differentiation of the one quality of extension into time and space," but I confess that it is very difficult to do so. It seems to me that for speculative physiology space-time cannot be completely isotropic—the x , y , z and t -dimensions cannot be of the same quality. I take it that our notion of space rests entirely on our degrees of freedom of bodily mobility. I can move backwards and forwards, and from side to side with equal facility but not nearly so easily can I move upwards and downwards. And the equal freedom of mobility in the x , y -plane is only possible because I can turn my body round a vertical (z)-axis in one direction or the other with equal facility but even then the turning movement from left to right is not quite the same as that from right to left but differs in some subtle way. And, of course, the difficulty of generating the z -dimension depends on the condition that our freedom of mobility is restricted because we move in a gravitational field. Only since we have become enabled to dispense (in thought) with the gravitational field as something physically unique has our space become truly isotropic.

Such as we are, however, the space-dimensions are not entirely isotropic and far less so is the t -dimension when

compared with the x, y, z -ones. The quality of duration I take to be entirely different from the others and we must, I think, regard it, with Bergson, as the cumulative continuity of life. It is a passage as well as the persistence of that which, in a sense, has passed. It is life-extension but it does not seem to me to be capable of "extensive abstraction" in Mr. Whitehead's sense. The passage is not a uniform one (though I confess I find it difficult to say exactly what is meant by uniformity in a durational passage).*

Obviously we do not obtain the conception of a moment of organic duration by the method of extensive abstraction, for this "moment" depends on what Bergson calls the "rhythm of duration": thus the "event-particle" in the conscious life of a boy of fifteen is not the same as in the man of fifty, nor does it appear to be the same in the ephemeral insect as it is in the long-lived reptile. The matter, however, is much too difficult to be pursued here.

It is also necessary that I should deal with the purely biological conception of variability. In general we mean by a variation a deviation from a morphological type, but I generalize the notion so as to include also deviations of functioning, acting, response and mentality, perceiving no essential differences between these organic activities. The organic "type," whether it be that of form, or behaviour, or mentality is, of course, only a convenient abstraction, but the general notion of "types" has brought with it the conception of variability. It is very convenient, in our description of nature, to speak of specific types and then of variations or departures from them. Observations and experiments, we say, "ought" to give unique values but for the accompanying errors of methods. So, also,

* "Time" in the sense of life-extension I regard as "humped" in the "neighbourhood" of a conscious entity in somewhat the same way as Mr. Eddington regards space as being "humped" or "peaked" in the neighbourhood of a material particle.

we postulate organic types which are accompanied by variations in the same way that experimental results are attended by error. Then we search (rather unsuccessfully, it must be admitted) for the "cause" of variability. Obviously, this conception of variability is the consequence of our adoption of the logical category of determinism.

Now there are organic activities that have all the appearance of spontaneity—whether these are truly spontaneous or not I do not argue—but there are also many activities which we call responses to events that occur "in the environment." These we can investigate and we can endeavour to establish a relation of functionality, in the mathematical sense, between the environmental "stimulus" and the organic response. It would be easy, I think, to make a series of such responses, beginning with tropistic ones, passing through reflexes in the decerebrate animal, reflexes in the intact one, and ending with those responses which we call "intelligent." In the various terms of such a series there will be "more or less" determinism, if one may say so without being misunderstood. At the one extreme we find (as in a tropism, or taxis) a degree of functionality which approximates closely to the behaviour of a compass needle in a variable magnetic field, and at the other we find that apparently capricious behaviour or functioning which must be so annoying to physiologists. I suppose that there must either be determinism, or no determinism, and so I have simply to reject the validity of this concept (except as a working method, of course) even at the risk of being exposed to the dreadful accusation of throwing overboard scientific method altogether!

One other thing I must endeavour to make clear—the distinction between the organic variations that are called "fluctuations" by biologists and those others that are called "mutations." The former are individual and acquired while the latter are congenital and are transmitted by heredity—they are not acquired. In the lower animals fluctuations, or

acquirements, do not materially influence the process of transformism and what are of significance from that standpoint are mutations, which do lead to transformism. In man, of course, certain fluctuations persist by reason of tradition: they are not bodily variations but means of action by tools (using the term "tool" in its most general significance). Now the distinction between fluctuations and mutations is evidently one that depends upon our distinction between a racial and individual life-passage. Life is, of course, a continuous career in the morphological sense: what is discontinuous in it is the personal passage which is marked by memory, blame, merit and responsibility—sin, if you like. The mutational variation belongs then to the racial passage and it is an acquirement of this continuous life-career; the fluctuating variation arises in the discontinuous personal life-passage, or career.

I return now, after this digression, to the saying of Newton. The ocean of undiscovered knowledge must, to him, have been like the material oceans explored by the voyagers of his century: they were unknown but whatever was there did not depend, in itself, in the least upon the vessels and instruments of navigation; it was only *revealed* by those methods. So, to Newton, physical laws were there waiting to be discovered, so to speak, but even if they were to remain undiscovered they would still be there. Without doubt he could have made most of the discoveries of the eighteenth century and perhaps those of the nineteenth up to the time of Clerk Maxwell had he been capable for a long period of that sustained intension of mind of which he spoke, for (I take it) those discoveries were implicit in the creative work of his early lifetime.

But were the later physical and biological results of the later nineteenth and the twentieth century there in the same sense as were, for instance, planetary theory and tidal dynamics? Were the quantum hypothesis of radiation and

our present-day notions of atomic structure present already in Newton's undiscovered ocean of truth? Could these conceptions have been deduced by him by a sufficient intending of mind from the mathematical, physical and dynamical relationships known to him? I take it that they could not and that only by the creative thought of Newton's nineteenth century successors did these parts of the ocean of truth *actually come into existence*.

Otherwise it would appear that there was mental determinism and that Clerk Maxwell, Hertz, Planck, Einstein, J. J. Thomson and others thought as they did think *because* Newton's mind worked in the way *it* did. And nothing in the results of modern biology seems to suggest that. I have referred already to the way in which mutations of form arise with all the appearance of spontaneity or lack of causation. It must have occurred to many biologists to attempt to predict the evolutionary career of some organic stock or other but beyond suggesting that certain specific forms are in process of extinction, or that some bodily parts of an organic species are becoming vestigial and tend to disappear nothing of the sort has, I believe, been attempted. No biologist has ventured to predict the appearance of a mutation—the essential step to a process of transformism. Now one admits the incredible complexity of the physico-chemical systems in which such mutations arise and we may well despair of laying bare the physical antecedents of a mutation—supposing that there *are* such. But the overwhelming impression that most biologists have, in thinking about these matters at all, is that of the spontaneity of appearance of the mutation. I admit that there is evidence that environmental changes may *induce* mutations; expose an organism to some environmental stimuli and mutations may arise but what we have to deal with here are active, functional adaptations of the organism, ways in which it *responds* to the external change. But that the particular nature of the response is a function, in the mathematical sense, of the particular

change in the environment does not seem to be established, nor do I think that it is likely.

Probably we must generalize "responses" in the widest possible way. I have argued elsewhere that the most various kinds of behaviour are of essentially the same organic nature. An "adaptation," I take it, is not merely a change in colour or form that renders an animal less conspicuous to its enemies or prey, or confers upon it some useful means of finding food or shelter, or of avoiding its foes. These changes are of much significance in hypotheses of the means of transformism and so they are the things that we usually think about when we speak of adaptations. But temporary variations of functioning (such as the process of sweating when one becomes warm) are also adaptations. So is the behaviour of a man who takes an umbrella with him on an unpromising morning, or that of the skipper of a vessel when he shortens sail in anticipation of bad weather.

Again the invention and use of a new tool is an adaptation and so also is the discovery of a new mathematical device (say tables of logarithms). It is quite true that some of these organic modes of behaviour are transmitted by heredity so that they become integral in the life-processes of the race while others would disappear on the death of the individual in which they are evolved. That, however, is because the one kind of adaptation (mutations) is characteristic of the racial life passage (it is germinal) while the other appears in the individual life-passage (it is somatic). It would disappear if it were not preserved by tradition.

So I can make no essential distinction between morphological or "organic" adaptations of functioning and those changes of ways of mental operation that we call scientific discoveries. The strengthening of the muscles of the fingers and wrists of a pianist; the formation of a skin callus on some part of the hand in consequence of the persistent holding of a tool; manual dexterity in some repetitional mechanical operation;

facility in arithmetical work; the finding of some new mathematical relationships (say Maxwell's four thermodynamic potentials) and so on—all these seem to me to be processes that have the same significance. In each of them there is something creative or new, some means whereby the organism becomes the better able to oppose the tendency to inert-materiality. This is, of course, pure Bergsonism: Maxwell's thermodynamic functions or the Christoffel "tensor analysis" are means of acting on nature. Sooner or later, someone endeavours to give even the most abstruse of mathematical results a "physical meaning" and sooner or later also, these results receive "applications" in industry. All "intended" thinking, I take it, aims at establishing inter-connexions between events in nature, All general discoveries are mental adaptations—something really new in organic behaviour.

And if that is so we must, I think, regard Newton's ocean of truth as amorphous in structure. The relations that are to be discovered in it are only *in* it in the sense that they come into existence with the thought that makes the relations. Our knowledge of nature, as Eddington says, is a knowledge of form and not of content, but even the form is carved out from a nature that may have any forms—or as many as are implicit within the limitations of the human mind. At any moment in human history, then, our description of nature is complete, that is to say, what more is in it than that which we know has still to be made by us. I feel that, as I have stated this there is something paradoxical in it, but my meaning will, I trust, be plain.

Finally, I return to Mr. Whitehead's saying—perhaps that which is urging nature forwards is in the future as well as in the present and past; and in the future that may be as well as in future that will be. I take this to be literally true. The impetus is certainly in the remotest past as well as in the present, since we inherit modes of acting on nature which have "passed" only in the sense that they came into existence one

after the other in "time," but which nevertheless endure in that they constitute our present life-mechanisms. The impetus is in the future that will be, surely, because many of the things that we do are done in order that some change, or condition clearly thought about but which has not yet happened, or does not yet exist, will come about as the result of our acting. So from the wolf we have bred the sheep dog and we are rearing rustless wheat and potatoes that are immune to disease. These organisms were not *discovered* in nature nor did they exist there in the literal sense—they were made, if my interpretation of the meaning of mutations is a right one. The impetus is in the future that may be, because in seeking for something we make something else. There is an ideal communistic state that may be and that is ardently desired by some. In seeking to make it our present-day idealists are, without doubt, making some other society, the form of which is not discoverable.



*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1,
on December 19th, 1921, at 8 P.M.*

IV.—PHYSICAL SPACE AND HYPERSPACES.

By F. TAVANI.

I.

I SHALL consider space under two aspects: 1. As object of perception, and by this I mean the physical space in which are the objects with qualities which we perceive. Such a space is to objects like a frame in which they either move or are at rest. 2. Besides such space, perceived with and through the bodies which it contains, we have also the idea of a space possessing the means for fixing and determining the position of a body with respect to another body. Space as the locus of entities, by means of which the position of something in it is determined, is a concept, a concept to which a percept may but does not necessarily correspond. The study of space as a concept belongs chiefly to analytical geometry of one, two, three, four, ..., n dimensions.

The properties of this space, taken in their most general expressions, are not objects of perception, they become such only for the particular case in which the dimensions are three. Thence the distinction between dimensions and hyperdimensions: while they are all concepts, to those concepts within the space of three dimensions perceptions correspond, but for 4, 5, ..., n dimensional spaces nothing in the world of perception corresponds. Hyperdimensions thus remain abstract entities suggested, not by perception, but by the possibility of generalizing the properties of the three-dimensional space to which a perception corresponds.

The object of this paper is to show that hyperdimensional space is physically real, meaning by hyperdimensional space a space defined by the characteristic that through any of its

points we can draw more than three lines perpendicular to one another. By physically real I mean an entity the existence of which is measured by time and determining or occupying a position C such that we can always fix two points A and B in the physical space so that a moving point P cannot pass from A to B without passing through C.

The proof is contained in a relation binding together the two expressions of a physical fact.* This fact is an hyperacceleration, which is a physical fact as much as the velocity itself, of which the hyperacceleration represents the change within an interval of an infinitesimal order higher and higher than that of the velocity. The analytical expression of it† represents this fact decomposed into its elements. These elements are physical facts themselves, as their addition has for result the whole of the fact itself. They are directed quantities, their directions being for the first three elements, three directions perpendicular to one another in the ordinary space, and for the other components from the fourth upwards, each of them has a direction perpendicular to all those which precede it in the order of the sequence. All this is mathematically established in the theorem embodied in the relation (2)* The meaning of the terms of this relation is very plain for the first three terms, they are quantities physically real. The others from the fourth upwards are also physically real, because they are elements of a fact which is so, and which would lose its integrity and become another phenomenon altogether, if the terms from the fourth upwards were not real, and if they were not such that when added together they would not form a fact physically real. The hyperdimensional terms (4th, 5th, ..., n th) are not in ordinary space, still as elements of a physical fact they must be connected with physical space. Such connexion is, as already mentioned, such that we can fix two points, A and B, of the ordinary space,

* See note at the end, formula (2).

† See note, formula (1).

correspondent respectively to the beginning and the end of the infinitesimal interval $(dt)^n$ (n expressing the infinitesimal order: 4, 5, 6, ..., n), so that the point P moving from A to B , with a law admitting hyperaccelerations, according to the conditions of the theorem, must occupy during the said interval the positions determined by the hyperdimensions.

Thus by a mathematical reasoning alone we are led into the presence of physical entities, which, while they possess the characters of physical reality upon the evidence of a logical process, the only evidence available in this case, still are unperceived. Are these entities still real or do they turn into shadows of reality since they cannot be perceived? This problem, which is strictly one in the domain of philosophy, must be met by the mathematician, who, led by the logic of mathematics, is brought in contact with such entities. While hyperdimensions were only mathematical abstractions chosen and made without any reference to physical reality, but only for the sake of giving generality to the methods and theorems of analytical geometry and mechanics of three dimensions, then the mathematician knew the realm of such entities: they did not belong to this world, they existed in a fairy land. But when we meet them in the analysis of a physical phenomenon then, if we want to keep our faith in mathematical analysis, which has been such a powerful instrument of discovery, we must consider their claim in the physical world, even if we are bound to modify our conception of reality in finding a home for them.

II.

From the meaning which I have fixed of something physically real, it is evident that this is defined in terms of time and physical space, taken as the highest terms, without passing the limits or touching the question as to the reality of these terms. I intend to avoid any inquiry concerning the reality of time and space, and of "what is reality" in its widest sense. I assume physical reality in the meaning given

above; to it belong the dimensions of ordinary space, and, according to the theorem expressed by the relation (2), the fact is established that dimensions and hyperdimensions belong to the physical world upon the same evidence, which is the evidence attached to the conclusion of a mathematical reasoning.

The said relation links, so to speak, the three dimensions of the ordinary space to the hyperdimensions in the expression of the same physical fact, and through them the reality of this fact is seen to continue beyond the boundaries of the perceptual space.

The evidence of their physical reality is the same for dimensions and hyperdimensions, as far as this evidence is given by the logical process which forms the proof of the theorem. Besides this, ordinary dimensions possess also the evidence derived from the perception corresponding to them. Obviously the evidence from perception adds itself to that from the mathematical reasoning, without either increasing the strength of the other in establishing the final conclusion aimed at by both of them. They remain independent from one another, each one sufficient to itself, to establish the reality of the fact, I should say, with an equal amount of light, if they are sufficient to expel any doubt of error in the process with which they evolve from their respective sources. It is only where the probability of error affects either of these two processes that they support each other in establishing the final conclusion common to both.

Thus if I see this table in front of me, the evidence that someone has put it here, is derived from such a principle that there is no need of any perception to confirm it. Logical evidence is not the only one which applies to unperceived objects, there is also another kind tending to establish the physical reality of unperceived objects. A perceiving process and a logical process have both in common the same prerogative of being what may be termed *a sign* of reality. The object or fact pointed by them has evidence of reality only in so far as it is pointed by these signs.

The evidence is good or bad relatively to the *sign* being good or bad or rather correct or mistaken, and if we could, by some means, reach a criterion of correctness of these processes we could define through them the reality of the object indicated by them. Perception as a sign of reality points to an object which is either actually given in the act of perception or so connected with the latter that the content of actual perception would lose the meaning of the reality which it otherwise possesses, and the act itself of perception would remain disconnected from the conditions by which its constitutive elements are real. Thus if in perception we perceive an object occupying space and lasting in time, with the moment in which its timely existence is given, there is given also with an evidence equally convincing, that the object has existed in some way through a series of previous moments, and it is connected in some way with a space which is not actually perceived. Our conceptions of time and space as assumed in physical reality are such as not to allow any distinction between the value of evidence given as to the existence of an object actually perceived and as to its existence in space and time essentially connected with the space and moment within the act of perception. In other words if we admit something to be real at a certain moment the evidence of that reality goes beyond the limits of that moment, and affects all that which I have defined as physically real. Thus if we consider the space described by a moving point P, taking motion merely as a correspondence between a determined interval of time, however small it may be, and a determined space, locus of the positions of P, during the said interval, if at the moment that motion is perceived, there is a correspondence between a real interval of time and a real tract of space, the reality of these two elements points to a reality at a previous moment of the correspondence, without which the actual moment would be impossible. So that if real space corresponds to a certain interval of time, however small this may be, a real space must

correspond also to any previous or smaller interval of time contained in it. To admit that the properties or characteristics of space which are recognized within an interval Δt of the motion, are the same as those within an infinitesimal interval of higher order, cannot be assumed as an axiom, and if accepted as a postulate it can be done, only provisionally, while there is no reason against it. It is just against such postulate that the theorem in question directs its consequences. It shows also how far lies the probability that in motion in general there is an instant in which the body is at rest or moves uniformly. To make an assumption of this kind is to fix a characteristic of the motion. This is what Newton did by assuming that the acceleration was constant and that therefore within an interval of time equal to $(\Delta t)^2$ the body moved uniformly. We cannot make any hypothesis about the motion within an interval of time, however small this may be, while the nature of motion is given by the law which it follows. It is to this analysis of motion within infinitesimal of infinitesimal intervals that the theorem lends itself. Before I give a description of the process followed in the proof I will briefly state the works and results of a few of the most eminent mathematicians, and I will try to approximate their results to mine, in order to see whether and how it constitutes a really new step forward.

III.

Mathematicians have built logical models of space taking their first move from the characteristics of perceptual space and by means of mathematical analysis have reached general concepts of which the three-dimensional space, the one to which perception corresponds, is only a particular case.* The researches on

* An idea of the large number of researches on this subject can be gathered from the valuable monograph of Professor Gino Loria, "Il presente ed il passato delle teorie geometriche." From Gauss's *Disquisitiones*, are inspired the memoirs of Riemann, "Ueber die Hypothesen welche der Geometrie zu Grunde liegen," and of Beltrami, and for sixty

this subject are independent of perception, they aim at the concept of space, and if perception has any relation at all to these general concepts, it is only that of an unnecessary fact correspondent to the concept of ordinary space, without any claim to ratify or strengthen the conclusions reached by mathematical analysis. At the side of this movement there is also a tendency to adhere strictly to the perceptual space, limiting geometry within the boundaries of experience and carrying out any possible progress only in harmony with the evidence supplied by perception. These two currents have no meeting point, one remains within the boundaries of mathematical analysis, the other within the evidence of perception and from this situation it follows that, so far, hyperspaces have remained a mathematical abstraction. Any system of analytical mechanics for hyperspaces was nothing else but a similar extension of the three-dimensional mechanics developed on the same lines as the geometry of hyperspaces.

A fact which could serve as a link between the analytical theory of hyperspaces and the physical world had not been found. The mathematicians did not start from the expression of a physical fact, nor did they look in the physical world for a confirmation of their theories, a confirmation which was not needed so far as the soundness of their reasoning was concerned, but only went on exploring in order to see what would the space be if the boundaries of the three dimensions were crossed, leaving the physical world behind, entirely closed within the three dimensions. Therefore, a real progress is marked beyond this situation by the theorem of relation (2)* in which the first member represents a physical fact and the second member is an expression of the same by means of hyperdimensions. This relation throws, so to speak, a bridge between the physical

years the production of researches seems to point out wider and wider fields of research. A large portion of this branch has been cultivated by Italian geometers.

* See note at the end.

world and the hyperspaces—the bridge which was needed. Moreover as the second member contains for the three first dimensions, those of the ordinary space, so it connects also the three dimensions of the ordinary space to those of an n -dimensional space.

Let us compare the method. It is the same as that to which Riemann ascribes the greatest success for explaining nature. He describes it in these terms: "The questions about what is indefinitely great are useless for explaining nature, but it is quite different for the question on what is indefinitely small. It is upon the exactitude with which we follow the phenomena in what is infinitely small that our knowledge of their relation of causality essentially rests. The progress of the recent centuries in the knowledge of the mechanism of nature depends almost entirely upon the exactness of the construction, which has become possible since the invention of the infinitesimal analysis." The theorem under consideration is a good illustration of the success of this method applied in exploring what happens to the motion when the infinitesimal interval of time not only becomes indefinitely small, but infinitesimal of an infinitesimally small interval. To this method I have added a new step, I have used a pure concept of dynamics for exploring the characteristics of space, it is something like the inversion of the ordinary process, in which from the study of space we derive the character of the motion. The law of the motion, which is generally the solution of some differential equation or system of equations, is obtained after assuming that the ordinary space is the seat of the motion. This assumption, however, does not leave to perception the last word about the nature of space, but it simply means that perceptual motion takes place within perceptual space. It leaves thus as being also true that the perceived motion is not the real motion, even within the limits of the perceptual space. For instance the motion of a billiard ball describing a straight line on a billiard table is far from being the real motion even within the boundaries of the

perceptual space. If the motion of the ball is referred to the centre of the earth the motion is helicoidal, if referred to the centre of the sun it has a more complicated path, and so on. Each of these motions is expressed by a relation or law of motion, and if this relation is an analytical function of time, which admits a finite and determined derivate of an order higher than three, then, according to the theorem, the whole motion does not take place within the three dimensions of the ordinary space, but it continues itself beyond the perceptual space, and to express it in its integrity, spaces of dimensions higher than three are necessary. So the whole motion has a perceptual side which is perceived through one, two or three dimensions of the ordinary space and part of its reality is hidden, so to speak, in a space of higher dimensions: to this space belonging also the physical dimensions in which the motion is perceived. All this is expressed and established by the relation (2) of which the first member represents a physical fact, viz., what happens of the motion during the interval of time $(dt)^n$, and the second member represents this same fact expressed in a space of n -dimensions, of which the first three dimensions are those of the perceptual space in which the perceptual part of the motion takes place.

Once having obtained a relation fixing the conditions which space must satisfy in order that a physical fact may take place in it, we have an answer to the question: "Whether space, independent of perception, *must* have some definite characteristics?" And in our particular case, "Whether space must have a definite number of perceptions?" a question which obviously cannot be answered by perception, nor by any conception of space assumed previously to any analysis of motion. In this way we obtain a new view of the relations between experience and the characteristics of space, a point on which Riemann himself declined to give any definite answer. The answer given by my theorem is "In order that a motion with an hyper-acceleration of the n th order may take place, it is a necessary and

sufficient condition that the space in which such motion happens should possess n dimensions," and as such motions do really happen, so the space really possesses n dimensions related to one another like the dimensions of the perceptual space.

IV.

Let us consider the order followed for establishing the theorem. I begin by considering an n -dimensional space, assuming it as an hypothesis which experience neither confirms nor contradicts. From this hypothesis I simply derive a series of magnitudes, representing lines, such that each one is perpendicular to all those which precede it and to the one which immediately follows in the order of the sequence. Then I introduce the idea of a moving point, independently of any system of co-ordinates; the point moves in the physical space and during its motion the ordinary dimensions are represented by the tangent to its path, the normal and the binormal. Then strictly following the operations of infinitesimal analysis, and replacing in the results thus obtained expressions containing the quantities of the set of n perpendiculars to one another, the relation of perpendicularity being simply expressed analytically, I arrive at an expression of the hyperacceleration decomposed into its components, referred to a system of n dimensions.

The process consists essentially in passing from an hypothesis to a physical fact which is found and expressed through such hypothesis, and this is nothing else but the scientific process by which we extend the knowledge of our physical world. When possible, perception comes to confirm the reality of the physical fact; this, however, is not strictly necessary where the reality of the fact stands beyond doubt, as is the case when the fact is established upon a rigorous reasoning or stands on a principle the truth of which does not require any assistance from perception.

From the expression of the physical fact, the hyperacceleration, by means of hyperdimensions, it is evident that these

belong to spaces which cannot be reached except by motions following a certain determined law, viz., when the law of motion is expressed by a function of time admitting a finite or determined derivate of order greater than three. In this case the smaller the infinitesimal interval of time within which takes place the change of the acceleration or the hyperacceleration, the greater is the number of dimensions of the space reached by the motion. Time seems to be the only principal variable bringing into evidence their existence, and as the hyperdimensions are the directions of the components of the hyperacceleration in the ordinary space and in hyperspaces, so even the generation of a straight line can be referred to motion only, thus "a straight line in a space of three, four, ... dimensions is the path of a point moving with a law expressed by a function of time, possessing finite and determined derivatives of first, second, third, fourth, ... order."

As from the idea of acceleration we can deduce a whole system of dynamics, so from the idea and expression (2) of the hyperacceleration we can deduce a whole system of hyperdynamics: hypermotive force, energy in hyperspaces, etc., these entities having a correspondent physical fact in the physical world not less real than their analogy in the space of three dimensions. But to develop these ideas is beyond the scope of the present paper and I will consider only a side which is strictly connected with the philosophical aspect of space thus conceived.

V.

It is the absence of perception that seems to be a strong reason for confining hyperdimensions to the realm of mathematical abstractions, so that although I have established their physical reality by a mathematical reasoning free from any help of perception still we must examine whether the absence of perception is a good reason against their physical reality.

Here again I must state as clearly as possible the limits of

my inquiry, leaving untouched any other more general question which from this point might become visible.

Perception is a sign of reality and a reality in itself or an event. From both points of view it is connected with time, viz., as a moment and as pointing to a reality existing in time. As a sign of reality it is also related to space inasmuch as this determines a place for the perceived object. In short, perception as an event is a physical fact and as a sign points to physical reality. Anything that perception shows to us it shows it as determined in space and time. These two entities are given to us through perception as the two co-ordinates of a plane which determine a point; the perceived physical reality, in which time and space meet as a continuation of what they are beyond that meeting point. The reality of this, at the moment that is given, asserts itself also as connected along the time and within the space in which it is given. Its reality, beyond the act of perception, is, as suggested in the perception itself, something which we connect with the reality of that fact, just as we connect time beyond that moment with the moment itself, and place with place. Time and space before they meet to form the event of perception and the reality of the object perceived, meet to form what may be called the history of that event and of the perceived object. The reality of such history is pointed out in the act of perception, so that it cannot be disconnected from it without affecting the reality of the fact as it is given in the act of perception itself. We are bound to follow up that history even through those moments in which perception was impossible, we are bound to find an interpretation of it, and this impulse is given from the act itself of perception, which if it asserts something real, asserts it so, as connected with its existence in some way through time and space beyond their reality asserted at the moment of perception. Time and space might not be real, still there is a stage in our knowledge of what is real, a stage in which they are assumed as such.

This is the boundary of my inquiry, this is sufficient for recognizing the reality of the physical world, with which I am here chiefly concerned in proving the physical reality of hyperspaces just as it is accepted for physical space.

So that recapitulating the points just considered I may say: something might be physically real though not perceived or perceivable. It is physically real if its existence is the consequence of a logical reasoning, though not perceived. Hyperspaces are physically real though not perceived if their existence is proved by a logical reasoning. We cannot build the reality of the physical world without admitting the truth of the judgments of perception and if we admit the truth of a judgment of perception at one moment there is a series of judgments of perception which are equally true about something which becomes later the event of perception and its object, connected in some way with the reality which is perceived and completing it so as to become the reality actually given in perception. Thus, if it is true that the light of the sun is shining at the moment that I see it, and if by a logical reasoning I am bound to admit that the sun as it is now existed before any vision of any kind could have taken place, then it is also true that the sun was shining at that time. It is only after recognizing that this judgment is true that we try to find out how that was, and in physics we attribute to the word light such a meaning as to lend itself to agree with the truth of such judgment. We construct the idea of light so that there was something real before vision and we identify that something with an essential element in the perception of light. By analogy, hyperspaces, if their existence is mathematically proved, are physically real, even if we are all born blind to them or our present organs of perception do not answer to anything in the world of perception correspondent to the concept of hyperspace. On the other hand the mathematical proof of their existence consists in this that the hyperacceleration, a physical event itself, takes place in a space of a number of dimensions equal to the order of the

hyperacceleration. This fact cannot be either included in nor established by Newton's dynamics, which, to the analysis of motion, presuppose already a notion of space, about which the first and last word is left entirely to perception.

Concluding these few remarks about the proof and meaning of the theorem here analysed and the claims to reality of anything which is proved to be so, independently of perception, I do not hesitate to say that through the veil of the perceptual space which perception throws round us from all parts, probably through a phenomenon of resonance, which surroundings have worked upon our senses, we see by means of this theorem, spaces of higher dimensions hidden from us by the three-dimensional space, but revealed to our mind by motions which penetrate their depth, their perception remaining perhaps a probable fact for more developed senses.

NOTE about the mathematical expressions of the theorem studied in the paper (see *Philosophical Magazine*, April, 1921).

$$\sum_{n=1}^n \phi_n I_n, \quad (1)$$

where $I_1, I_2, I_3, I_4 \dots I_n$ are quantities of which the first three I_1, I_2, I_3 , represent respectively the tangent to the path described by the moving point P , the normal and the binormal—and the others: $I_4, I_5 \dots I_n$ verify the condition, analytically expressed, that each one of them is perpendicular to all those which precede it and to the one which immediately follows in the sequence. $\phi_1, \phi_2 \dots \phi_n$ are elementary functions of the velocity of the point, P , and curvatures of the path.

$$\frac{d^n P}{dt^n} = \sum_{n=1}^n \phi_n I_n, \quad (2)$$

in which $d^n P/dt^n$ represents the hyperacceleration of order n of the point, P , moving with a law expressed by $P = f(t)$, such that $f(t)$ admits a derivato determined and finite of order, n . I_1, I_2, I_3 represent the dimensions of the ordinary space, and $I_4, I_5 \dots I_n$ represent the hyperdimensions.

*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1,
on January 16th, 1922, at 8 P.M.*

V.—PLATO'S THEORY OF ΕΙΚΑΣΙΑ.*

By H. J. PATON.

IT is, I suppose, universally admitted that the portion of the *Republic* which deals with the line and the cave is one of the most important passages, if it is not the most important passage, for a proper understanding of Plato's position with regard to the problems of knowledge. Yet it is almost impossible to get a coherent account of this fourfold division or of the reasons which can have led Plato to make it. It is not uncommonly supposed that there is no fundamental difference between the two highest activities or between their objects, but many of those who recognize that Plato was sharply distinguishing the mathematical sciences and their objects from philosophy and its objects, yet fail to observe any similar distinction as regards the lower part of the division. They have no use for a distinction between *εἰκασία* and *πίστις*. To them as to the Sophist a shadow is as real as the object which casts it, and we find for instance the American critic Mr. Shorey boldly asserting that *εἰκασία* and the *εἰκόνας* are "playfully thrown in" for the sake of "symmetry." It is surely a strange reading of the character of Plato as a seeker after truth to maintain that in the very heart of his greatest work and at the very core of the problem of knowledge he should disturb and confuse those who are seeking to understand his doctrine with a little wholly uncalled for "playfulness" even though it should be for the sake of "symmetry."

* I must express my debt to Professor J. A. Smith who originally suggested to me the line of reflexion on this subject which I have endeavoured to follow.

It is strange that in a place marked by the suppressed but tense emotion of one who is setting forth the very essence of all that he has thought, there should occur without the least hint or warning a passage which has no counterpart in his thinking, which is at its best superfluous—and at its worst misleading. It is stranger still that in a later dialogue—*The Sophist*—the very turning point of the argument, the question of the possibility of error and of sophistry, should rest upon a similar meaningless distinction expressed in almost identical words. If we have any respect at all for Plato as a thinker we must put this down as grotesquely improbable; and the mere incapacity of the critic to understand his doctrine will not be for us a sufficient proof that there is no doctrine to understand.

The interpretation which we seek to uphold is that each of the four sections of the line represents a *different* kind of cognitive activity, and the objects of these different activities are *different* objects.

To establish this we must hark back to the argument which comes immediately before the fourfold division. We are trying to establish a distinction between *δόξα* or opinion and *ἐπιστήμη* or knowledge. *Δόξα* is supposed to lie between ignorance and knowledge, and its objects are supposed to lie between the objects of ignorance and those of knowledge. To establish the distinction we consider the character of *δυνάμεις*, i.e., faculties, or better, powers. One power differs from another according to its different objects and its different function*—*ἐφ' ᾧ τε ἔστι καὶ ὁ ἀπὲργάζεται*. The power of sight has the function of seeing and its objects are colours. The power of hearing has the function of hearing and its objects are sounds. Now knowledge, if it is really knowledge, must be infallible—this is very important—while opinion as it is mere opinion is fallible. That is to say—because the functions of the infallible

and the fallible must be different—knowledge and opinion are different *δυνάμεις*, and therefore *they have different objects*. Such is Plato's argument, and whether we regard it as sound or not there can be no doubt that he accepted the conclusion.

Having established the necessity of difference in the objects we proceed to ask what these different objects are. The *δύναμις* of *δόξα* clearly lies between ignorance—which is of course simply nothing—and knowledge. It is as it were clearer than ignorance, but not so clear as knowledge. Its objects must lie between the objects of ignorance and the objects of knowledge. Now the objects of ignorance which is nothing are themselves nothing, or simply what is not. We cannot philosophically speaking be ignorant about *anything*. Ordinary statements of that kind imply some sort of cognition of an object in some sense real. Ignorance is mere blankness or darkness and it cannot have an object. Its objects literally do not exist.

The objects of knowledge on the other hand are the truly real—*τὸ παντελῶς ὃν παντελῶς γνωστόν*. They are the *εἶδη* or true universals—the self-sufficient, self-dependent, perfect, timeless, intelligible realities, which are, and are what they are, and are never other than they are. What then are the objects of *δόξα*? We expect them to lie between what is not—the object of ignorance—and what is—the object of knowledge. We find them in the world of *τὰ γιγνόμενα*, the things of sense and change, things which are never themselves, but are continually passing over into something else, things which in a sense are and in a sense are not, “tumbling about between being and not-being.” It is in this sphere that we find what we are seeking. These objects are between the objects of ignorance and the objects of knowledge. They have a greater clearness and reality than that which is merely a blank nothing, but they have far less clearness and reality than the real intelligible objects which we grasp by reason apart from sense.

Clearly, then, for Plato—whether he was right or wrong—

the objects of *δόξα* are very different from those of *ἐπιστήμη*. This difference is the greatest difference possible. The objects of the different *δυνάμεις* of seeing and hearing were, we saw, different. We see colours and we hear sounds. But this difference is as nothing to the difference of the objects of opinion and knowledge. In comparison with this second difference these minor differences become negligible. In comparison with this second difference seeing and hearing and their objects become similar, and we class them both under the *δύναμις* of *δόξα*, which is opposed to the *δύναμις* of *ἐπιστήμη*.

Consider now our subsequent procedure. We take a line stretching, as from the allegory of the cave we may guess, from darkness into light. We divide it in two unequal sections, the first of which is *δόξα* and the second *ἐπιστήμη*. The first section, that of *δόξα*, is presumably the shorter as having less reality. We then subdivide these two sections in the same proportion, which gives us in the first section the smaller division of *εἰκασία* and the larger division of *πίστις*, and in the second section the smaller division of *διάνοια* and the larger division of *νόησις* or *ἐπιστήμη* proper. We thus establish a mathematical proportion, $\text{δόξα} : \text{ἐπιστήμη} = \text{εἰκασία} : \text{πίστις} = \text{διάνοια} : \text{νόησις}$ or *ἐπιστήμη* proper. Again, keeping to the same terminology (though Plato varies), $\text{εἰκασία} : \text{διάνοια} = \text{πίστις} : \text{νόησις}$. Note further* that this proportion holds not only between the activities, but between *their objects*. *Οὐσία* or being, the object of *ἐπιστήμη* : *γένεσις* or becoming, the object of *δόξα* = *ἐπιστήμη* : *δόξα*. Plato expressly refrains from drawing out the proportions between the subordinate divisions* and *their objects*, *τὴν ἐφ' οἷς ταῦτα ἀναλογίαν* in order to avoid many words. Surely that is to say clearly that this proportion certainly exists.

What are we to make of these proportions? Clearly that what we can say of the relations of *ἐπιστήμη* and *δόξα* and

their objects can be said also in a different degree of the relations of the subordinate divisions and their objects. Now, in the first place, we have shown that the objects of *ἐπιστήμη* and *δόξα* are different from one another; and therefore it is probable that the objects of the subdivisions are also different from one another. Further, as *ἐπιστήμη* is clearer than *δόξα* and its objects are more real than those of *δόξα*, so the power of each division is clearer than the power of the division which precedes it, and the objects of each power are more real than the objects of the power which precedes it. That is to say, we are mapping out in the first place the different cognitive powers of the human spirit, the different forms in which it is manifested, the different stages by which it passes to full knowledge. And we are also mapping out the *different* objects of these *different* powers. The difference of the powers goes side by side with a difference in the objects. The principle is stated clearly by Aristotle, *Nic. Eth.*, 1139 *a b*: "For to generically different objects must correspond generically different parts of the soul, if as we hold, it is in virtue of some kind of likeness or kinship that we are able to know them." *Ἦρὸς γὰρ τὰ τῷ γένει ἕτερα καὶ τῶν τῆς ψυχῆς μορίων ἕτερον τῷ γένει τὸ πρὸς ἑκάτερον πεφυκὸς εἴπερ καθ' ὁμοιότητά τινα καὶ οἰκειότητα ἡ γνῶσις ὑπάρχει αὐτοῖς.*

The difference in the powers is, as we have seen, a difference in clearness. What is the difference in the objects? It is a difference in reality, or what is for Plato the same thing, a difference in intelligibility (*ἀλήθεια*). Everything that is and is known is of course in a sense real. The wildest dreams and the most absurd delusions in some sense are. But within this real we find different kinds or degrees of reality. We separate the whole real first of all into *τὰ ὄντα* on one side (the things which in a special sense are, and are real and intelligible), and *τὰ γιγνώμενα* on the other (the things for ever changing, tumbling about between what is and what is not). Within *τὰ ὄντα* we make a further subdivision into *τὰ μαθηματικά*, the

objects of *διάνοια* or the mathematical sciences, real indeed in comparison with the changing objects of sense, but unreal in comparison with the *εἶδη*, the true realities, the objects of *νοήσις* or *ἐπιστήμη* proper. So within *τὰ γυγνόμενα* we make a similar subdivision, the *εἰκόνες* or shadows or reflexions in some sense real, but unreal in comparison with the objects of *πίστις*, the actual animals, plants, and manufactured articles among which we lead our waking life. The thesis which we seek to maintain is that this lower division is in no sense less important or less significant than any of the other divisions, and that it indicates our first objects and our first activity in our difficult path towards the real.

But before we proceed to attempt a justification of this view we may be asked what is the relation between these so-called different activities, and again between these so-called different kinds of objects, and how is it ever possible to pass from one to the other. Our reply is, in the first place, that we have to determine what Plato meant before we can pass on to criticize his meaning; and, in the second place, that we shall try to deal with these difficulties in regard to the special section which we are attempting to consider. Yet we may say here that although the general relation between the different kinds of object is of course a special and unique form of relation, we may describe it variously and inadequately and metaphorically as the relation of the sign to the thing signified, the symbol to the thing symbolized, the relation of the appearance to the reality, or, though not in the scientific sense, of the effect to the cause. The relation is apparently not identical for the objects of the different sectors, but the analogy or parallelism always holds. The relation between the objects of *εἰκασία* and those of *πίστις* is given (*Republic*, 510 *a*) as *τὸ ὁμοιωθὲν πρὸς τὸ ὃ ὁμοιώθη*, i.e., the relation of the copy to the original. In the cave it is described as the relation of the shadow or reflexion to the thing which casts it, and the same view is suggested by the theory of *μίμησις* in the tenth Book. In 511 *a* a similar relation is said

to exist between the objects of *πίστις* and those of *διάνοια*. The objects of *πίστις* which have images or copies of themselves under *εἰκασία* are themselves only images or copies of the objects of mathematics, and of course it is a commonplace that all *γυγνόμενα* are like the *εἶδη* or are copies of the *εἶδη*. Still we must remember that all this is metaphorical, and if taken too literally is misleading and even false. Plato himself shows this in the *Parmenides* as regards the relation between the *γυγνόμενα* and the *εἶδη*. If it holds literally at all, I think it holds between the actual changing individuals which are the objects of *πίστις* and the more real unchanging individuals which are the objects of *διάνοια*. This is possibly suggested by the fact that if our proportion is to hold, the second segment of the line must be the same size as the third segment. But perhaps this is to press too far what may merely be an accident without any definite philosophical meaning.

Summing up our advance so far, we have discovered with reasonable certainty the general principles of the fourfold division—a difference of power involving a difference of objects. This is fully borne out by the allegory of the cave. Further proof or confirmation can only be obtained by considering what the objects are and how they are different. To do so as regards any two of the subdivisions will, of course, in itself immensely increase the probability as regards the other two subdivisions, that is to say in our case if we can show that the objects of *διάνοια* and of *ἐπιστήμη* proper or *νοήσις* are different, *i.e.*, if the objects of mathematics and those of philosophy are different, we have indefinitely added to the presumption that the objects of *εἰκασία* and *πίστις* are also different. Needless to say we hold very definitely that the objects of *διάνοια* and *ἐπιστήμη* are in Plato's view different, as Aristotle expressly said, and that Plato was right in thinking so. But for this purpose at present we can only refer to the limited justification in Adam's Edition of the *Republic* and also to some remarks in Burnet's *History of Greek Philosophy*.

We pass then to our special discussion of *εἰκασία* and the objects of *εἰκασία*, and of how they differ from *πίστις* and the objects of *πίστις*.

Let us first of all sum up what are to be our conclusions.

Εἰκασία is the first ingenuous and intuitive vision of the real. Its object is simply what appears, τὸ φαινόμενον. It makes no distinction between the different levels of reality. For it there is no distinction yet made between the real and the unreal, or, if you prefer it, real and unreal do not mean anything to it. It is cognitive and has an object, but it does not affirm or deny: that is, it does not claim to be true. Truth and Falsehood, Reality and Unreality, Fact and Fiction, these are distinctions which have not yet arisen. It is identical with that *αἴσθησις* or Intuition of the first part of the *Theaetetus* which is supposed by the Sophist to be knowledge, but which cannot be in contradiction with any other *αἴσθησις* because it does not yet judge, i.e., because it does not yet lay claim to what is called Objective Truth. There is no word for it in English but we may call it Imagination or the cognition of images, or again Intuition or the mere looking at objects.

Its object as we might expect from its derivation is the *εἰκὼν* or image. We must not, however, call it a mental image, in the dangerous language of modern writers on logic and psychology. Nor again may we call it a real image as opposed to a mental image. It is not subjective as opposed to objective nor objective as opposed to subjective. These phrases when they mean anything mean a distinction between the real and the unreal, and in this first stage of consciousness, examined as it must be from within, that distinction has not yet arisen. Still less can we say that it is mistaking the image for the thing, the unreal for the real. That is mere error, it is not *εἰκασία*. For *εἰκασία* we repeat again there is no distinction between the real and the unreal, and consequently there is no possibility of mistaking one for the other. There is no claim to truth, and consequently there can be no possibility of error.

We can now proceed to give an indication of its objects in detail, and if these appear to be of no metaphysical importance we hope to show later that this is not so. The images* are "firstly shadows, secondly reflexions in water and in things that are close grained and smooth and bright and all similar things"—*πρῶτον μὲν τὰς σκίας, ἔπειτα τὰ ἐν τοῖς ὕδασι φαντάσματα καὶ ἐν τοῖς ὅσα πυκνά τε καὶ λεία καὶ φανὰ συνέστηκεν καὶ πᾶν τὸ τοιοῦτον.*

This is not further developed in the present passage as Plato is concerned with higher themes, but we learn from the tenth book that the artist also holds a mirror up to nature, and he appears to create† animals, plants and manufactured articles (the very things we shall afterwards find belong to *πίστις*) as well as the earth and the sky and the gods and all things in heaven and in the House of Hades beneath the earth, but in reality he offers us a mere *φάντασμα* or *εἰκὼν* of these things.

We find exactly the same view in the *Sophist*. We have on the one hand the things‡ made by God, not here the *εἶδη* as in the *Republic*, but animals, plants and inanimate substances, animals and their elements, fire and water and the like, and on the other hand we have the things§ made by man, houses and other manufactured articles. All this is of course the object of *πίστις*. But we must set against these the images made by God and the images made by man. The description is similar to that in the *Republic*. "The images§ made by God are the images or appearances (*φαντάσματα*) which spring up of themselves in sleep or by day, *e.g.*, a shadow when darkness comes in the light of the fire, or in cases where a double light, that external to an object and that belonging to it, comes together about bright and smooth objects, and creates a shape giving us a sensation the reverse of what we ordinarily see." *Τὰ τὲ ἐν τοῖς ὕπνοις καὶ ὅσα μεθ' ἡμέραν φαντάσματα αὐτοφυῆ λέγεται· σκίῃ μὲν ὅταν ἐν τῷ πυρὶ σκότος ἐγγίγνηται, διπλοῦν δὲ ἥνικ' ἂν*

* 510 a.

† 596 c.

‡ 265 c.

§ 266 b.

φῶς οἰκεῖόν τε καὶ ἀλλότριον περὶ τὰ λαμπρὰ καὶ λεῖα εἰς ἐν συνελθὼν τῆς ἔμπροσθεν εἰωθυίας ὄψεως ἐναντίαν αἴσθησιν παρέχον εἶδος ἀπεργάζεται. Now whatever be the theory of reflexion in this passage it is clear that the things here spoken of—the images made by God—are the same as those of the *Republic*, the *shadows* and reflexions of real things with the addition of the objects which appear to us in dreams. The similarity of this to the doctrine and language of the *Republic* is in itself sufficiently remarkable. The addition of dreams is not in the least surprising in itself, and it is clearly suggested in the *Republic*, e.g., 414d, when in the myth of the three natures, gold, silver and bronze, Plato asserts that this early education of the guardians was just a dream below the earth and when he describes the φιλοθεάμονες* as dreaming. And we may note here incidentally for the complete parallelism of the line that as we in εἰκασία appear to be dreaming about γυγνόμενα, so the mathematician† is said to be dreaming, dreaming about τὸ ὄν—ὀνειρώττουσι μὲν περὶ τὸ ὄν, ὕπαρ δὲ ἀδύνατον αὐταῖς ἰδεῖν.

So far we have the images made by God, but we have also the images made by man as in the tenth book of the *Republic*. Not only do we make real houses, but the artist will paint for us another house,‡ “which is a sort of dream created by man for those who are awake”—οἶον ὄναρ ἀνθρώπινον ἐγρηγορούσιν ἀπειργασμένην.

It is this fact of the image made by man which makes it possible for us to track down the Sophist to his lair and to show the nature of error. Surely this would not be possible if the doctrine were of no metaphysical importance, and if we shrink from putting art under the first activity of the soul, we must not let this stand in the way of recognizing the truth. On this point also we shall maintain that Plato's doctrine is profoundly true.

We have now got as the objects of εἰκασία shadows and

* 476 c.

† 533 b.

‡ 266 c.

reflexions, the dreams of the sleeper, and the dreams of the artist.

Let us turn to the *Theaetetus* to perceive the common character of all this. Here we have a preliminary stage of consciousness set against thinking about the world, set against what is here called δόξα. This preliminary stage is called αἴσθησις, sense or intuition. It may be objected that we have no right to identify δόξα with πίστις and αἴσθησις with εἰκασία. The use of different words shows that we are dealing with different things. To this we reply that the use of different words shows no such thing. Anyone who is acquainted with the works of Plato is aware that in spite of the precision and consistency of his thinking he is not at all careful about what we may call terminology. Even in this particular part of the *Republic* with which we are dealing he varies his terminology—but never his argument—as far as we can see for no reason unless possibly for reasons of rhythm. Thus δόξα is first of all distinguished from γνῶσις or ἐπιστήμη using these words indifferently, e.g., 478c, 477e. Later, 510–511, he divides ἐπιστήμη into the subordinate divisions of διάνοια and νόησις. When he comes back to this in 534 νόησις is the word for the whole section with διάνοια and ἐπιστήμη as its subordinate divisions. Still more frequently of course he varies his language according to the particular point with which he is dealing. Thus in the *Republic* he speaks of the objects of δόξα as τὰ γιγνόμενα in order to mark them off as comparatively unreal from the εἶδη or τὰ ὄντα. This does not prevent him in the *Theaetetus* from calling the objects of δόξα τὰ ὄντα, i.e., real in comparison with the objects of αἴσθησις.

For ourselves we can only say with Plato οὐ περὶ ὀνόματος ἀμφισβήτησις. If he chooses to call the same thing by a different name, we shall not refuse to see his meaning.

Now it is clear that in the *Theaetetus* he is describing two stages in knowledge and two stages which are below the level of διάνοια and ἐπιστήμη. In the *Republic* and in the *Sophist*

(though we shall have to return to the *Sophist* later) he appears to set forth the same doctrine as to the two stages below *διάνοια* in much the same language. What more probable than that—especially if we are right in setting the *Theaetetus* between the *Republic* and the *Sophist*—the two stages described in the three dialogues are the same? If we find that the same doctrine is apparently taught about these two stages the change in the name will not prevent us from accepting it as one.

The *δόξα* of the *Theaetetus* certainly appears to be the *πίστις* of the *Republic* and its objects appear to be the same, e.g., he mentions a wagon (i.e., a manufactured article) as such an object. I do not think anyone will find difficulty in identifying these. But *αἴσθησις* may appear to be wider than *εἰκασία*. We do indeed get certain things classed under it which we might naturally expect to find. Thus we get what is before us in dreams—as we have had already in the *Sophist*—and also what is before us in diseases* generally and particularly in madness. So far we appear to be still in *εἰκασία*. But in addition—and this is our difficulty—we get the whole of *αἴσθησις*, the whole ingenuous unthirking vision of reality whether in memory or in imagination, and in addition, all that we ordinarily call pure sense, all *αἴσθησις* which does not as yet involve judgment.

What we suggest is this, that this general *αἴσθησις* or intuition is the same as *εἰκασία*, but we now get it described in more detail, and only now is the full extension and meaning of it made clear.

Note that this is exactly what we should expect from the purpose of the different dialogues. Both in the *Republic* and in the *Sophist* we are dealing with particular problems. In the *Republic* we are dealing with the character of philosophy and the training which must precede it. In the *Sophist* we

are concerned with the nature of sophistry and error. In both we merely allude to our doctrine in regard to the first activity of the knowing mind in order to elucidate the point we have before us. There is no reason in either for giving us a comprehensive account of this activity for its own sake.

In the *Theaetetus* it is quite otherwise. Here we are primarily concerned with the lower stages only. I take it that the primary purpose of the *Theaetetus* is by an examination of these lower stages to show that they cannot give us knowledge. We are allowed to infer that we can only find knowledge when we come to the εἶδη, as any intelligent disciple of Plato would be sure to do. It is ludicrous to say that in the *Theaetetus* Plato gives up the doctrine of the εἶδη. That theory is implied all through. Yet just because we are not concerned with it primarily, but with the lower stages, we naturally get a fuller account of these stages than we get elsewhere.

In the first place then, what is the broad general character of this first stage of cognitive experience? It is called αἰσθησις, but this is neither the sensation nor the perception of the psychologist. It is rather, as we have said, the first ingenuous and intuitive vision of the soul whether in sense, memory or imagination as that is before thinking begins. We have here the bare or immediate object, presentation or appearance.

And secondly, what is Plato's doctrine about it? He appears rather to accept than to reject the sophistical account of it. About it he seems to urge three main points: (1) that we have other objects not got at in this way; (2) that if we consider it in this way apart from thinking it becomes simply what we should call a stream of separate unrelated images—i.e., what may naturally be described as the εἰκόνες which are objects of εἰκασία; and (3) that if in this the mind is merely passive the stream of images becomes simply the flux of Heraclitus in which we can find no foothold and in which it is impossible to have any object before us at all.

It is true, indeed, that he does not use the word *εἰκασία* or *εἰκών*. If we may hazard a conjecture this might be because here he is not concerned to show that the appearance is in any sense like the natural object, as the natural object is like the *εἶδος*—his great contention in the *Republic*. But he does identify *αἴσθησις* with *φαντασία** which is surely near enough for our purposes—and he speaks of the objects either as *φαντάσματα*†—a word which he uses alongside of *εἰκών* in the *Republic* and of *εἶδωλον* in the *Sophist*—or in one place as *φάσματα*‡—*φάσματα ἐν ἡμῖν*—a word which is, of course, used of the phantoms which appear in dreams. He also uses the word *πάθος*§ to indicate at least the comparative passivity of the soul.

Note particularly that *αἴσθησις* is not sense or sensation though it includes it. Its object is simply *τό φαινόμενον*, that which appears, and is what it appears, whether in dreams or madness, whether in sense, memory, or imagination. It is what is called "an idea" in the works of modern logicians, as in the phrase "The Association of Ideas."

It is now that we begin to see its metaphysical importance and to realize that it was not without good reason that Plato introduced it into the *Republic*. It is often suggested by commentators that *εἰκασία* indicates no special and separate way of knowing, but there have been many philosophers who have held that it is the only way of knowing, and that nothing more is possible. It is what Hume, who understands it far better than its average supporters, calls the stream of impressions and ideas. By the agnostics of all ages from Protagoras to Hume it has been identified with the whole of knowledge, and its objects have been identified with the whole of reality. The world of appearances is everything, everything is what it seems and seems what it is. It is reality for me. There is no possibility of contradiction or of error. There is no such thing as Truth and no such thing as Philosophy. Memory, sense, imagination,

* 152 c.

† 167 b.

‡ 155 a.

§ 166 b.

and all that we call Thinking or Knowledge are on one dead level, and that is the level which is described by Plato under the heading of *εἰκασία*.

So far we have simply been trying to determine what Plato as a matter of fact classed under *εἰκασία*. We must now endeavour to understand why he did so, and this should enable us to grasp his position more clearly. We hope it will also enable us to justify it. It will probably be generally agreed both that it is natural to class hallucinations, dreams, and perhaps even imagination under *εἰκασία*, and to consider these as offering us a special class of objects. Any doubts that are entertained about the reasonableness of Plato's position will most probably be felt (1) in regard to sense and its objects and (2) in regard to the activity and products of the artist.

But before going on to examine these two questions in detail it is necessary to state, more or less dogmatically, what are the objects and the activity of *πίστις*, in order that we may have a clearer understanding of the difference between *πίστις* and *εἰκασία*.

The objects of *πίστις* as indicated by both the *Republic* and the *Sophist* are the things made by God, animals, plants, and so on, and the things made by man, namely, manufactured articles, houses and chairs and what not. These are distinguished from the images made by God, shadows and reflexions and dreams, and from the images made by man, as, for instance, in painting. In other words, what we have here are real things, the things of our ordinary world. We prefer to call this the *actual* world, rather than the *real* world, for the word *real* strictly speaking, belongs only to the *εἶδη*.

The activity of *πίστις* is best called Judgment. "The soul," Plato says in the *Theaetetus*,* "when thinking appears to me to be just talking, asking questions of herself and answering them, affirming and denying. When she has arrived at a decision,

* 190 a.

either gradually or by sudden impulse, and has at last agreed and does not doubt, that is her opinion or δόξα," and we may add her belief or πίστις. Τοῦτο γάρ μοι ἰνδάλλεται διανοουμένη οὐκ ἄλλο τι ἢ διαλέγεσθαι, αὐτὴ ἐαυτὴν ἐρωτῶσα καὶ ἀποκρινομένη, καὶ φάσκουσα καὶ οὐ φάσκουσα. ὅταν δὲ ὀρίσασα, εἴτε βραδύτερον εἴτε καὶ ὀξύτερον ἐπάξασα, τὸ αὐτὸ ἤδη φῆ καὶ μὴ διστάξῃ, δόξαν ταύτην τίθεμεν αὐτῆς. From the *Sophist* we get the clear statement, fully borne out by the general argument both of the *Sophist* and the *Theaetetus*, that the characteristics of Judgment are: (1) that it affirms or denies;* and (2) that it is true or false.†

Further there is present in it two elements—an element of αἴσθησις taken as identical with εἰκασία and an element of pure thinking.‡ This element of thinking may apparently be either the inferior thinking of mathematical διάνοια or the superior thinking of philosophy. It is this element which leads us on from πίστις to pure thought about τὰ ὄντα, and it is the combination of the element of αἴσθησις and that of thinking which renders error possible. False opinion lies neither in the intuitions in relation to one another nor in the thoughts, but ἐν τῇ συνάψει αἰσθήσεως πρὸς διάνοιαν, in the combination of intuition and thinking.§ This is fully borne out by the *Sophist*.

The activity then is Judgment. It is Affirmative or Negative, True or False. It involves an element of αἴσθησις and an element of thought. This element of thought grasps among other things οὐσία|| or being or reality, and this implies that it affirms or denies the existence of its object. Every judgment is an existential judgment. By thinking alone we are able to distinguish between the real and the unreal, between being and not-being—a distinction which does not exist for εἰκασία. And we now understand how the objects of

* 263 c.

† 263 b.

‡ Th. 194 b.

§ Th. 195 c.

|| Th. 186 c.

judgment are the ordinary things of the actual existent or so-called real world.

That is to say like *εἰκασία πίστις* has under it many objects—and we must not narrow it down to the instances given by Plato in a special connexion in the *Republic*. It comprises all assertions which claim to be true as opposed to false, and all *γιννόμενα* which are actual and objective as opposed to unreal and subjective. It comprises in a word all that is not *αἴσθησις* on the one hand or pure mathematics and philosophy on the other. It is a posteriori or empirical knowledge, *γνώσις κατὰ τὴν αἴσθησιν*.* It includes all empirical science and all history as well as the ordinary judgments of the ordinary man, *τὰ τῶν πολλῶν πολλὰ νόμιμα καλοῦ τε πέρι καὶ τῶν ἄλλων*.

Having now indicated the nature of *πίστις* we may return with more insight to our two main problems in regard to *εἰκασία*: (1) the question of sense; and (2) the question of art.

The question of sense and its objects is exceedingly difficult, and we may be unable to thread our way successfully through all its mazes, but we note in the first place that this view is not so strange to the view of the *Republic* as might at first sight appear. In the tenth book Plato practically identifies the sensible appearance with the *εἰκὼν* of the artist or the mirror. The artist is indeed said to imitate the bed made by the craftsmen, but that actual bed is one and yet it appears different from different points of view. There is a difference between what it is and what it appears,† *οἷα ἔστιν* and *οἷα φαίνεται*. Note incidentally how this bears out the complete parallelism of the line. As is the *εἶδος* of bed to the many actual beds in which it is manifested, so is each actual bed to the many appearances of it in sense. But note especially that these appearances of the bed to sense are called *φαντάσματα* or *εἰδῶλα*.‡ It is these appearances to

* *Th.* 193 c.

† 598 a.

‡ 598 b.

sense, and not the actual bed, which are imitated by the artist, and these *φαντάσματα* or *εἰδωλα* are actually like the work of the painter. The appearances to sense are on exactly the same level as the shadows or reflexions or images whether made by God or made by man. Again in *Rep.* 602*cd* we get a clear confirmation of the view that all *αἰσθησις* especially sight is included under *εἰκασία*. We are given a simple case of the passage from the appearances to a reality or actuality behind them. Plato points out that so far as sight is concerned, things may appear bent in water and straight outside, a thing may appear concave when it is convex and convex when it is concave, and again if we have two things equal in size they appear different in size to the eye according as they are near or far away. These appearances we suggest are *εἰκόνες*, and so long as we take them merely at their face value, so long as we are satisfied with making them clear to ourselves and do not seek to go behind them, we are in *εἰκασία*. There is so far no question of error. The things do appear so. Every appearance is just different and that is all about it. But if we want to know what the thing actually is, we get at it by counting and weighing and measuring, so that not the apparent size, shape and quantity may rule in our souls but rather the actual size, shape and quantity determined by mathematical measurement or calculation—*τὸ μετρεῖν καὶ ἀριθμεῖν καὶ ἰστάναι*.* By this means we pass to *πίστις*, to the actual world of solid bodies—in fact to animals, plants, and manufactured articles. This means clearly that as far as secondary qualities are concerned—compare *Theaetetus*, 154*a*—we must always be satisfied with *εἰκασία* or *αἰσθησις*. They are what they seem and they may seem different to different men or to the same man at different times. But primary qualities are on a different level; in regard to them we can

* *R.* 602*d*.

distinguish between the merely apparent which is given to *εἰκασία* and the actual which is determined by *πίστις*.

And surely in this Plato is right. Like any other image or reflexion these appearances of sense are mere appearances. They are what they seem and they seem what they are. Each *δύναμις* gives us its proper objects, we see colours and we hear sounds, but *τὰ κοινὰ*,* sameness and difference, likeness and unlikeness, and above all *οὐσία* or being cannot be got through sense. Thus *αἰσθησις* apart from thinking has no part in *οὐσία*,† and therefore it has no part in truth. Clearly it must be classed not under *πίστις* but under *εἰκασία*, though there are certain difficulties which we will recur to later.

It is no use saying that the objects of sense perception are distinguished from those of dreams or imagination by following upon what is called an external stimulus. Apart from the difficulty of knowing what this means, we are here describing *εἰκασία* not from within but from without. We can indeed come back to *εἰκασία* afterwards with a knowledge of mathematical science and with an explicit metaphysic and we can distinguish its objects in this way, but *εἰκασία* itself knows nothing of external stimuli; for the first stage of cognition all objects are on the same level of reality, and it makes no distinction of less and more real within them. It is for this reason that Hume, that most consistent of all sceptics and that subtlest defender of *εἰκασία* as coextensive with the whole of knowledge, refused to distinguish impressions from ideas by reference to an external reality, and distinguished them only by less or greater degrees of vividness, though in so doing he ignored the fact that the images of our dreams are often more vivid than those of our waking life. It is also for this reason that Hobbes in the first chapter of the *Leviathan* informs us that "sense is in all cases nothing but original fancy," and again "their appearance to us is fancy the same waking that dreaming."

* Th. 185-6.

† 186 e.

We are now in a position to understand better the relation between the objects of *εἰκασία* and those of *πίστις*. It is only on the level of *πίστις* that we pass to the actual which is consciously distinguished from the apparent. The typical case of this is the determination of the actual primary qualities by some sort of mathematical measurement or thinking, *ἔργον λογιστικοῦ*, *R.* 602 *c.*

Into the exact character of this mathematical thinking we need not enter in detail—that would belong to a discussion of *πίστις* and we are primarily concerned only with *εἰκασία*. But it is not simply a matter of measurement. The actual size of any object we never can see at all. It can never appear to us in *εἰκασία*. The size of any object as far as *εἰκασία* is concerned is never twice the same. If it is far enough away it will appear a mere point, if it is near enough it will blot out the heavens. This applies as much to a measure, *e.g.*, a foot rule as to anything else. When we say that an object is a foot long we are not merely stating an equation between two infinite series, we are not merely saying that if we have the apparent object and the apparent foot rule in juxtaposition whether near the eye or far from it they always have the same apparent size. We do not think that either the foot rule or the object actually becomes smaller as it recedes from the eye. On the contrary, we think their actual size is unvarying and is always relatively in the same proportion to other actually unvarying sizes. This is believed to be the only reasonable theory capable of explaining our experiences in sense. When one reflects on the extraordinary amount of subtle scientific thinking involved in reaching this conclusion—thinking in comparison with which the discovery of the law of gravitation is mere child's play—and when one remembers that it is done by all of us in the first few years of childhood, one is impressed with a profound respect for the intellectual attainments of even the meanest of the human race.

This brings us to another point, that the objects of *πίστις*

as opposed to those of *εἰκασία* are wholly unperceivable, *i.e.*, they can never be given to us in sense. We have seen that the actual size of any object is unperceivable and that we can identify the actual size with no one of the infinite apparent sizes. The same obviously applies to all solid shapes whatsoever. If we take even such an elementary figure as a solid regular sphere we can certainly never see it. All we can see is an infinite number of apparent hemispherical shapes varying infinitely both in colour and in size. By thinking about these sensations we conclude they can only be explained by the hypothesis that behind them is a solid sphere unvarying in size and incapable of being seen, *i.e.*, that they are the many varying appearances of one solid sphere. When one comes to the theories of the scientists—who of course are only carrying on the same process more systematically—this becomes still more clear. The atoms and electrons of the scientist are believed in, but they can certainly never be seen.

Our view then is meant to be a defence of so-called realism against the idealists of the Berkeleian school, a defence of the ordinary man's belief in the existence of a solid and relatively permanent world of actual things in space. It is also an attempt at least partially to justify the claims of science to be true against those who hold—like Benedetto Croce—that science is a mere invention or fiction made by us for purposes of convenience. The actual solid bodies of ordinary consciousness and science are no doubt an invention, a construction—they are not and cannot be given in sense—but if their existence is the only reasonable explanation of our experience in sense and is the condition of our having such an experience, we are justified in believing in their actual existence and in rejecting the unworkable theory of idealism which involves itself in hopeless difficulties as soon as it tries to understand our experience in detail. On the other hand Plato is surely right in calling our cognition of such objects mere faith or *πίστις* and not knowledge. We cannot know *certainly* anything but an intelligible necessity,

which excludes of itself any possible alternative. This we are never in a position to assert positively either about the general theory that actual solid bodies exist or about any particular attempt to work out that theory in detail. And of course we must admit that the relation between our sensations and actual solid bodies—at first so simple—involves perhaps insurmountable difficulties, especially if we attempt to reverse the process of transition and to understand how ether waves or chemical changes in the brain can become for instance a sensation of red. But here we may be asking ourselves wrong questions or creating difficulties for ourselves, and in any case these difficulties are not greater than those which meet the idealist when he denies the existence of solid bodies altogether. Plato would perhaps put down these difficulties to the positively unreal and unintelligible character of all *γυγνόμενα*.

We would add here that these difficulties arise for the idealist—as for the realist—as soon as he tries to explain the possibility of communication between different spirits. A noteworthy instance of this is Croce's intolerably confused account of the extrinsecation of art. Nor is this an accident. Although in most cases the idealists appear to assume the existence of other spirits besides themselves, they have no real reason for doing so which would not equally justify them in assuming the existence of actual solid bodies. Both assumptions are a matter of reasonable faith and not of knowledge, and indeed they appear to be bound up with one another. We pass to other spirits by a kind of syllogism in the sphere of *πίστις*. These variously coloured appearances are, we say, explained by the movements of an actual solid human body. These movements in turn can be explained only by the volition of an eternal spirit. This appearance is the sign of a body. This body is the sign of a spirit. Thus we pass from heard sounds or seen colours to a spirit which is their source. The second stage of the argument involves some sort of philosophic thinking as opposed to the mathematical thinking of the first stage, but

it seems to depend on the existence of the first stage, and in any case the reasoning is of the same general character throughout. If we reject the first judgment, we ought logically to reject the second.

We are prepared then on our doctrine to accept the truths of the scientist as a matter of reasonable faith, but we are not without an answer to him when he goes on to maintain that these unperceivable objects—his atoms and electrons—are reality and the only reality, or when he stupidly denies the existence of spirit by what is nothing more or less than a contradiction in terms. We do not say that he is wrong in attributing to his atoms a greater reality and intelligibility than belongs to the things of sense and in holding that the things of sense are only intelligible in the light of them. We do not even say that the things of sense are after all in some sense real, and that what he calls his knowledge is only reasonable faith or probable hypothesis. What we do say is this. He has arbitrarily stopped in the soul's journey towards reality at a stage which can never satisfy the divine spirit of man, which can never be intelligible in itself and which is always in some sense unreal. He is satisfied with the *ἀγῶματα* of the cave as these are visible in the light of an earthly fire. His objects are still unintelligible and unreal. They are in perpetual flux and continually become other than they are. The source of their reality and intelligibility lies even for the scientist in something other than themselves, and he continues for ever in an unending process of explaining them as the effects of some cause which is itself equally unintelligible and unreal. The very relation of cause and effect he does not profess in any way to understand. His objects are still tumbling about between being and not-being. If he is to attain reality or truth he must continue the journey upon which he has only entered. Just as he sought the one unperceived reality behind the many appearances, the one relatively permanent body behind the many fleeting and transitory images, so he must again seek the one intelligible

non-spatial reality behind the many things of space, the one eternal reality behind the flux of bodies. Once more he must pass from the sign to the thing signified, from the conditioned to the condition, from his many objects to the meaning which lies behind and explains them—he must pass in short from the many to the one, from the changing to the eternal, from the unreal to the real, from the individual to the universal, from the *γενόμενον* to the *εἶδος*. This second transition he must make, not by the easy methods of counting and weighing and measuring, but by the more difficult method of dialectic—though he may be prepared for this, perhaps he must be prepared for this, by mathematics. And in this process he may never rest till he passes to the absolute one which lies behind and explains the many *εἶδη*, the unconditioned condition of all things, the one which is reality itself and more than reality, self-sufficient, self-intelligible, self-real—the Idea of the Good itself.

We have said enough on this topic at least to suggest the importance of Plato's thought. If our view is a right one, we have made good at least a plausible case for a real difference between the two kinds of objects, and what is more, we have by so doing established a most remarkable parallelism or analogy between the different segments of the line and their objects. To both of these points we shall return later, but at present we must pass to our second question, the question whether Art is properly to be included under this section.

Our first point is that we have already answered the question in the affirmative. Until we have a reference to the actual world there is no distinction possible, as Plato suggests in the *Thaetetus*, between sense, memory and imagination. This view is fully confirmed by David Hume. We are only able to distinguish these from one another because we consider their relation to an actual world, sense having an actual object immediately behind it, memory having had an actual object behind it in the past, and imagination having no actual object behind it at any time. That is to say, when we come to *πίστις* and look

back upon *εἰκασία*, we can make certain distinctions within it, but from the point of view of the man in *εἰκασία* these distinctions simply do not exist. Imagination *quod* imagination takes no account of the difference between the apparent and the actual and is therefore properly included in *εἰκασία*.

If we admit this in regard to imagination, we have admitted it already in regard to the artistic activity as a whole. For the function of the artist *quod* artist is nothing more and nothing less than imagination, *i.e.*, the making images clear or express to himself. Art is not at all the communicating of these images by means of musical instruments or wrought stone or air-waves or chemical substances disposed upon a canvas. Art is the inner vision and the inner vision alone, whether obtained—as we say afterwards from the vantage ground of *πίστις*—in mere imagination or by hearing sounds from an actual instrument or seeing colours suggested by an actual canvas. The beauty of the vision depends solely upon its own internal character as an appearance, and not upon these subsequent irrelevant and non-æsthetic considerations. The artist is a dreamer or maker of dreams. His work is a dream made by man for those who are awake, *ὄναρ ἀνθρώπινον ἐγγρηγόρσιν*.

The artist has surely all the marks of the stage of *εἰκασία*. He bids farewell to truth—*χαιρεῖν τὸ ἀληθές εὐσάντες*—and therefore to falsehood. He does not assert or deny anything, it is impossible to contradict him, what he says can only be called true or false by departing completely from the æsthetic standpoint. He is merely looking at his object and making it express or clear to himself. All these characteristics are precisely those which belong to *εἰκασία* and distinguish it from *πίστις*. As far as æsthetic considerations are concerned, it is wholly indifferent to the artist whether the originals of his *εἰκόνες* exist or not. He is satisfied with his appearance and with his appearance alone.

That this stage is the earliest in the development of the mind is borne out by experience. The savage and the child

alike are occupied chiefly with the life of sense and the life of imagination. Indeed, they are said not to distinguish clearly between what they see and what they imagine, which means of course that they have not yet got a secure hold upon *πίστις*. In the history of literature also it has been observed as a curious paradox that poetry precedes prose, and in general that art precedes science and history. This paradox we are now in a position to understand. On the other hand, we must not make too much of this confirmation from experience. In actual experience things are inextricably confused, and the temporal order is a very imperfect indication of the logical order.

So far we have been able to justify Plato's position, but it is only fair to add that there are certain difficulties in regard to his doctrine which we are not in a position at present to surmount. We have still to take into account the fact that Art is not passive, and that, although it must always be sensuous, it is not confined to objects which are given to us directly in what we call sense. The latter point I think Plato admits, although he is inclined to ignore it. His attitude to the former is not I think quite clear.

In regard to the former point that Art is not passive, we might naturally reply that sense is not passive either, but that it definitely involves an activity of the soul. There must be an immediate element in it, for otherwise we should have nothing before us at all, but, on the other hand, we must always have the activity of the soul in holding together the past and the present, and also in distinguishing and comparing objects, or once again we should have nothing before us at all. That is to say, in addition to the immediate element of sense there must be some sort of active intellectual element, an element which, although not reflecting upon likeness or unlikeness, sameness or difference, is yet making the objects or appearances clear to itself by an implicit recognition of their presence. Such indeed appears to be the argument of the *Theaetetus* in regard to *αἴσθησις*, that if you take it as mere sense you are reduced to

contradiction and absurdity. Plato there brings forward again his favourite argument that different powers have different objects, we see colours and hear sounds,* but just as we cannot see sounds or hear colours, so we cannot see or hear likeness or unlikeness, sameness or difference, oneness and manyness, and again being or value of any kind—the beautiful and the ugly, the good and the evil. In a word τὰ κοινὰ must be seen by the soul itself and without the aid of these, pure αἴσθησις is apparently impossible, though in *Th.*, 186 c, he seems to suggest the contrary. Instead, however, of going on to explain how these may enter into αἴσθησις without its becoming δόξα, he passes straight to an examination of δόξα, which we have so far identified with πίστις. Obviously, however, if εἰκασία is the same as αἴσθησις, and if it is to remain distinct from πίστις, we must give some sort of account of the intellectual element in it, and how that is possible without its immediately becoming πίστις or δόξα.

However dangerous then the admission may be to our theory, we must insist that even in what we call sense there is an activity of the soul, and without this activity of the soul which recognises the implicit likeness and unlikeness of its seen colours and heard sounds, we could not have either seeing or hearing at all. The sophistical view which denies activity to the soul in sense we must simply reject.

If we take up this position in regard to what from the point of view of πίστις we call sense, we must do so still more in regard to what from the same point of view we call art. In so far as art is and always must be sensuous it involves the intelligent activity of the soul which is necessary to distinguish its objects from one another and to hold them together in one whole. But art is more than merely sensuous. Plato, indeed, speaks as if the painter merely imitated or recreated one of the innumerable φαντάσματα or sensible appearances of a bed,

* 185 a.

but he also speaks of the tragedian as imitating a good or bad ἦθος,* although he insists a trifle grudgingly that it is very difficult to imitate a good ἦθος. However that may be it is clear from this and many other passages, and, indeed, from the briefest consideration of the history of literature, that art can imitate, or as we should say create, a good or bad character, which, of course, can never be given to sense at all. The artist can indeed imitate "all things† in heaven and in the House of Hades beneath the earth."

Hence it appears that when we have risen to the solid bodies and to judgments of value, we can fall back to the ingenuous point of view about them and dream about them as artists, so that they in turn become to us appearances or shadows, about which we ask no further questions. Even mathematical figures and philosophic universals may enter into εἰκασία so far as they help to express an individual character or situation. It is only because we have learnt to distinguish the apparent from the actual, and to understand our actual human life, that we can dream about individual intelligible characters as, *e.g.*, in novels and plays. It seems nonsense to say that the character of Hamlet is less intelligible to Shakespeare than the character of Julius Caesar is to Mommsen. Art is still distinct from philosophy and history, but it has a comprehension of the universal in so far as that is implicit in an imagined individual character.

All this, however, does not alter or affect our main contentions in regard to εἰκασία. The dramatist is not asserting anything or denying anything any more than the musician or the painter. He makes no claim to truth, and, therefore, cannot be charged with falsehood. He is concerned only with his individual object, and for him the distinction between the apparent and the actual, or, again, between the γιγνόμενον and the εἶδος, cannot be said to exist. He is concerned with his

* R. 604 e.

† 596 c.

object, not as an instance of a philosophic truth, or as a reproduction of an actual fact, but as an appearance and an appearance alone.

The distinction in regard to the objects also remains. The artist is not dealing with the same thing as the historian, even when his characters have had historic originals, as, *e.g.*, in Shakespeare's *Julius Cæsar*. Shakespeare does not assert that, as a matter of fact, Mark Antony made his famous speech, or even that he actually was that sort of person. He is dealing not with the real Mark Antony but with a shadow or reflexion cast by him. The excellence of his work depends upon its own internal structure, and not upon its resemblance to actual historical events. If there is any merit in such a resemblance it would be a merit which was definitely not æsthetic. The only verisimilitude we have a right to ask from the artist is that his work should be like itself, *i.e.*, that it should be internally coherent, or, in a word, æsthetically good.

Again, in spite of what we have said of the implicit universal in art, and the necessity of its presence, if we are to have an individual object at all, the object of the artist is an imagined individual and an imagined individual alone. He is concerned only with making clear to himself the individual and unique lineaments of his immediate object, not with determining what actual object lay behind it and suggested it, nor with generalising about it, nor again with working out its mathematical implications or philosophic conditions. There can be no greater error about art than to imagine it begins with generalities or universals, or worse still with facts, and seeks to communicate them to us through the medium of individual appearances. The artists who do that are bad artists, or, in a word, are not artists at all. To the artist art is not the sign of anything other than itself. Rather it is wholly satisfying in itself. Whatever may be the logical implications of the work of art, whatever it may seem to be afterwards to the philosopher, the scientist, or the critic, for the artist is just this, this

unique and individual child of his fancy, and nothing else in the whole world.

We must indeed be on our guard against certain superstitions which throw doubt upon this doctrine. It is maintained for instance, that owing to the very constitution and character of language it can express only the universal and never the individual. If this were true it would indeed be fatal to our theory. Mr. Bradley, *e.g.*, *Principles of Logic*, p. 47-9, says, following Hegel, that we can never express the individual, even although he admits the extraordinary consequence that we always say something different from what we mean. The word "this" for instance he asserts to be a universal, which he curiously describes as a "*symbol whose meaning extends to and covers innumerable instances.*" But this is surely a confusion. The word "this" torn from its actual context and placed in order in the frigid pages of a dictionary may possibly be described in such a way. But living as it does in the actual speech of men, unique in its context and its tone, it does express its unique object and nothing else in heaven or earth. The same applies to all the words of the poet in the actual poem, whatever be the case with the quite other words of the grammarian and the lexicographer. It is ridiculous of the scientist to vivisect a work of art and then to complain that it is not alive.

The same considerations are a sufficient answer to the unimaginative people who declare that if you examine the words of a poem you will see that they do assert or deny something. Of course if you refuse to consider a poem as a unique and indivisible living thing, and abstract from it certain dead things which you call words with fixed meanings, you can say anything about this dead abstraction that you please. Any sentence in a poem might, in a different context, be an assertion of actual fact. That does not alter the fact that in its living reality it is nothing of the kind, but is simply the expression of a unique and individual *εἰκὼν* on appearance. If we wish to know

whether any particular expression is in *εἰκασία* or *πίστις*, we must take it not as an abstraction but in its full and living reality, and ask whether or not it claims to assert anything or to be true. If it does, it is not *εἰκασία* and it is not Art.

We may observe here that our theory, although it appears to offer an intelligible interpretation of the general theory of the line, is not without certain difficulties in regard to the language used by Plato in the *Republic*. These difficulties arise especially in regard to our contention that *εἰκασία* cannot be true or false, but is satisfied with appearances alone. It is only fair to mention what some of these difficulties are.

Firstly, he says, in regard to dreaming*—which we know to be *εἰκασία*—that it is thinking “that a thing which is like something is not really like it but is the same thing as that which it is like”—τὸ ὁμοίον τῷ μὴ ὁμοίον ἀλλ’ αὐτὸ ἡγῆται εἶναι ὃ ἔοικεν. He is referring to those who mistake the many beautifuls for the one beautiful. If this is to be taken literally it would be fatal to our position, but we must reply that it is a description of this stage not as it is in itself, but as it would appear to one who stood on a higher plane. The *φιλοθέαμονες* have not really made the distinction and confused between the things distinguished—that would be an error in *δόξα*—they have failed to make the distinction altogether and can only loosely be said to be mistaking one thing for another.

With a similar looseness of terminology he describes the poet as having *ὀρθὴ πίστις*† and *ὀρθὴ δόξα*‡ about his object if he obeys the person who uses the object imitated. That would strictly mean that the artist could have a false *δόξα*, which is impossible to him as an artist. Indeed we know that the artist cannot properly speaking have any *δόξα* or *πίστις* at all. If anything is clear in Plato that is clear, and when we add that he speaks of the user‡ of the thing having *ἐπιστήμη*, we see at once that he is not using the words in their technical sense, but is merely

* 476 c.

† 601 e.

‡ 602 a.

leading us up to the conclusion* that the artist imitates only appearances. He imitates a thing as it appears, generally, Plato suggests, as it appears beautiful to the many and the ignorant, but that even if it were true does not alter the fact that he is just imitating or creating an appearance and not judging it. In fact the reason why Plato is condemning him is just because he does not judge, he is blaming the artist for not being a scientist or an historian.

Again the allegory of the cave appears to suggest that most men are always in *εἰκασία*. Perhaps Plato actually thought they were, as he apparently thought the will of most men was mere desire or *ἐπιθυμητικόν*, which in our view is bound up with *εἰκασία*, as *θυμοειδὲς* is with *πίστις* and *λογιστικόν* with *νόησις*. Most men are satisfied with the seeming good and don't go behind it. On the other hand all men do go behind appearances to actual animals, plants and manufactured articles and are, therefore, in *πίστις*. If the allegory of the cave does not suggest this it is because no allegory can be perfect in all details.

Again in 516c we are told that the men in the cave not merely look at present appearances, but remember past appearances and guess about future ones. This is probably the ordinary meaning of *εἰκάζειν*, to guess without real understanding. If Plato means a mere pleasant exercise of the imagination about what may happen in the future, this is quite properly called *εἰκασία*, but if it involves any claim to truth, it is really *πίστις* and we must put it down to the difficulty of making an allegory exact.

Lastly we may note Plato's statement as regards contending† in the law-courts about the shadows of justice and the images which cast the shadows, *περὶ τῶν τοῦ δικαίου σκιῶν ἢ ἀγαλμάτων ὧν αἱ σκιαί*. The philosopher who has been concerned with justice itself at first finds it difficult to

* 602 b.

† 517 d.

talk about the *ἀγάλματα* of justice, *i.e.*, actual just laws and acts. But what are the shadows cast by these? They are perhaps the purely imaginative pictures drawn by rhetoricians and politicians not so much from a desire to mislead—that would be mere lying—but from a desire to please and to work on the emotions of the Great Beast. Incidentally this bears out our view that the artist is concerned not only with the shadows or appearances of actual objects in sense, but that all things in heaven and earth, historical facts and even philosophic truths may cast shadows with which the artist may deal. There are no limits to the objects of art except that Art is satisfied with making clear a mere appearance or shadow and does not ask about its truth or reality.

But we must pass on to a general summing up of our position, and a brief examination of the general objections to it. We began from Plato's argument about *δόξα* and *ἐπιστήμη*, and the difference of their objects; and from his insistence on the proportion between the smaller segments of the line and these two fundamental ones we suggested that the objects of the different segments must be different. These objects in the case of the two lower segments and especially in the case of the lowest of all we have examined, and have made out at least a plausible case for their difference both as regards sense and as regards imagination or art. We are of course prepared to do the same for the superior segments of *διάνοια* and *νόησις*, and, as we have already pointed out, success as regards the lower two segments indefinitely strengthens our case as regards the upper, and *vice versa*.

It must be observed further that, although we began from Plato's insistence on the proportion and inferred from it a sharp difference in the objects, our examination of the objects has, I venture to suggest, thrown a flood of light on what is meant by the proportion itself. We have come across a series of most remarkable parallels in regard to the different transitions involved in this account of knowledge. If Plato begins

with a sharp distinction between, *e.g.*, the one *εἶδος* and the many beds, nothing is more natural that he should find a remarkable parallel in an equally sharp distinction between the one bed and its many appearances. The advance from *εἰκασία* to *πίστις*, like that from *δόξα* to *ἐπιστήμη*, is an advance from the many to the one. Similarly, the advance from *διάνοια* to *νόησις* is also an advance from, *e.g.*, the many mathematical ones which are *ἀεὶ ὄντα* to the one *εἶδος* or oneness itself. Each transition is towards greater reality and intelligibility, and each upper segment requires the presence of an element given by the lower segment, although it is not primarily concerned with that. Even in regard to the unfortunate use of *μίμησης* the object of *εἰκασία* does not imitate the object of *πίστις* any more than the *γυγνόμενον* imitates the *εἶδος*. These are mere phrases intended to lead the pupil up to a grasp of the true relation.

As regards the *δυνάμεις*, he appears to be arguing that they are really different: (1) as having different objects; and (2) as having different functions. That is to say, you may develop any one of them indefinitely—you may rise, for instance, from mere sense to the highest products of art—but you will never in this way pass into the higher *δύναμις*. Art could never become science or history, science or history could never become *a priori* mathematics, and *a priori* mathematics could never become philosophy. Each of the higher segments requires the previous one as its basis, but it must definitely make a fresh start.

Now it may be contended that such a view is derogatory to Art, and that such sharp breaks or transitions cannot exist.

As regards the first point, we must answer that it is not really so. Plato indeed was unkind to art, at least in the *Republic*, and some of his remarks appear to be both bigoted and stupid, though even here, what he attacks are the errors due to substituting art for philosophy or history, that is to taking

art as true. We must have the *φάρμακον** of knowing what Art really is if we are to avoid pollution. But whatever be Plato's errors in detail, his general position is in no way derogatory to Art. *Eikasia* is a necessary stage in cognition, all our material for thinking is given to us through it, and we must continually go back to it for refreshing and new life. We would add also, though Plato is less clear on this, that it is good and satisfying in itself. It is the opponents of this doctrine who are the real contemners of art, for by insisting on a gradual transition they would make art merely an inferior kind of history and philosophy, to be completely swallowed up and superseded with the advance in knowledge. This would make the value of art lie in something other than itself, in the philosophical or general truth that it conveyed or in the historical facts which it represented. Our view, on the other hand, can recognise the autonomy of this activity and maintain that the value of art lies in nothing other than itself.

As regards the objections to sharp breaks or transitions, we have already pointed out the danger of the mere continuum theory, the result that all the lower cognition would have to be superseded as worthless. We suspect also that it really involves ultimately a still more terrible disaster, the denial of all spiritual activity or growth, the reduction of everything to the lowest that we know. Plato's view, on the contrary, admits the possibility of real growth, the coming into existence of something new. More generally still, we cannot pretend to find much comfort in the philosophy whose ultimate principle appears to be that, after all, things are pretty much of a muchness. We suggest, on the contrary, that the world must be full of real differences, if it is really to be a unity, and not a mere welter, or chaos, or pure blank.

On the other hand we are not unwilling to make certain concessions. We recognize that there are real difficulties

remaining both as regards our attempts to explain Plato's meaning and as regards our attempts to defend it. Yet we may suggest that our attempt to explain has at least one merit; we have not been afraid of supposing that he had a real meaning to explain, nor of risking the possibility of error in an attempt to make this clear. So many of the critics appear to begin with the assumption that Plato was talking more or less at random, and that they will sufficiently explain him if they talk more or less at random too. We can only say that we have tried to do justice to him as a philosopher, even if sometimes we may have misunderstood him as an artist. It is a form of offence which he himself would be likely to forgive.

As regards our attempts to defend we admit even greater difficulties. Plato certainly generally tended to speak as if there were were a sharp opposition between the *γιννόμενον* and the *εἶδος*, but it is doubtful if this was really his ultimate view, and it is still more doubtful if it can ultimately stand. If we give up or modify this ultimate opposition, we must of course equally give up or modify our similar sharp distinction between the apparent and the actual. But we do insist that both in Plato's eyes and in reality, these distinctions have at least a didascalie truth. It is only by making them that we can lead ourselves and others up to the ultimate and true view which lies behind them. If we have not learnt them we have learnt nothing. Ultimately they may be necessary moments in every act of cognition or what you will, but even if we have still to find the unity which lies behind and explains these differences, we venture to express the belief that it will illuminate and not annul them, that it will explain rather than destroy.

*Meeting of the Aristotelian Society at 21, Gower Street,
London, W.C. 1, on February 6th, 1922, at 8 p.m.*

VI.—STANDARDS AND PRINCIPLES IN ART.

By A. H. HANNAY.

I.

IN his Romanes Lecture entitled *Criticism and Beauty* which he delivered at Oxford in 1910, after expressing in a characteristic manner dissatisfaction with the results which had hitherto been obtained by æsthetic inquiry, Mr. Balfour declared that there was at any rate one point in æsthetics which had been definitely decided: "The attempt to limit æsthetic expression by rules is seen to be futile. The attempt to find formulæ for the creation of new works of beauty by taking old works of beauty to pieces and noting how they were made is seen to be more futile still . . ." He did not, however, go very deeply into the reason why this kind of criticism had become antiquated. He just pointed to the general agreement that it had not worked. A more searching analysis might have led him to offer a more positive definition of the nature of the beautiful. As it was, he stopped at the implication that if there is an objective beauty it is not amenable to rules. For the rest he expressed sincere doubt whether beauty could be said to possess objective worth, whether æsthetic pleasures were not really incommensurable and totally subjective. In fact he had no definite principle which would serve in the place of the system of rules and standards and was therefore driven by the force of logic in the direction of subjectivism.

Mr. Balfour's case is fairly typical of the average contemporary discussion of the problem. It represents a stalemate in æsthetics: either rules and standards and objectivity or no rules and standards and subjectivity, or more correctly, arbitrary

taste and caprice. Neither alternative is quite acceptable and yet no third possibility is envisaged. And because of this lack of a third possibility it is not quite true to say that the criticism by rules is obsolete. For the ideal of that criticism still survives and impels to a continual reaction, sometimes open, sometimes concealed under new phraseology, to the dogmas of laws, rules and standards. It survives in Mr. Balfour's thinking. "To what objective test can judgment about beauty be made amenable," he asks, and again "what title has the opinion of experts to authority in matters æsthetic . . . why should men endeavour to make their feelings into the patterns it prescribes. . . ." He regards the standard of objective excellence as ideal, but unrealizable. Elsewhere and often in the most enlightened quarters not only is this governing ideal behind the theory of rules still dominant, but also the systematic formulation of rules is being vigorously pursued. The Director of the National Gallery, for instance, Sir C. J. Holmes, is the author of a work styled *The Science of Painting*. Although he explicitly denies any intention of short-circuiting invention and originality, he nevertheless aspires to "a complete all embracing theory which will enable artists to be peaceable, art patrons to be confident, and art critics to be unanimous," in fact to abolish both criticism and patrons and to set up in their place a single unshakeable, unchangeable scientific instrument. To this end he prescribes a whole series of rules as to design, composition, spacing, shadow, colour, etc., which hover, uncomfortably between the exalted position of universal norms or standards which artists will neglect to their undoing, and the humble position of mere generalizations from past works of art which may be of use to artists who have the same kind of individual content to express. Of course the artists had much better refer to the actual individual works from which they will be able to draw something of the living spirit, instead of studying a skeleton.

In current journalism the problem of standards and of sub-

jectivity and objectivity in art enjoys a periodical emergence and is invariably debated on the basis of rules or standards and objectivity and no rules or standards and subjectivity. The problem, for instance was raised in a leading article in the *Manchester Guardian* in June, 1920, and being of a liberal and freedom-loving temper and unable to supersede the two alternatives this newspaper advocated the view of criticism as the expression of personal enthusiasm which may convey a sense of values personally felt but cannot arrogate to itself any objective validity. Or again a translation was recently published of a book by a French writer, Jules Lemaitre, who practices the kind of criticism advocated by the *Manchester Guardian*. This translation was reviewed by an eminent critic in the *Observer* and his review is an admirable instance of the perplexity of the times on this subject. He strongly disagreed with the attitude of the French critic; he thought that there is a real and appreciable difference in value between works of art, and that there do exist certain apposite criteria of judgment. Equally strongly, he deprecated the application of the scientific method which formulates laws. Nevertheless, he reflected, if criteria do exist they must be capable of discovery by generalization from admitted masterpieces; but this would be a very dreary task which had better on the whole be left to the Germans. In fact he glimpsed a third possibility, but in the effort to define it he fell back upon a new disguise for the old scientific method, and himself half perceiving the disguise, decided to relegate further research to persons with a predilection for rather pedantic studies.

It seems that the dissolution of the old systems of rules and standards, canons and laws has left a temporary void and that while lip service is often paid to the current philosophic dictum that beauty is unique and indefinable and is either experienced or not experienced, there still exists a deep rooted desire for some more tangible and constructive assistance towards clarity and uniformity of aesthetic perception. Philosophy, which is

usually eyed askance as adding to the difficulties of life, is here invoked in order to simplify and make easier. It is assumed that if only we could discover wherein beauty consists, we could in future both achieve and perceive it without any failure or contretemps. In no other province of human activity, except that of morality, is the demand for standards so strong and persistent. Science, which itself finds laws in nature, is not in a tearing hurry to find laws for its own process of thinking and discovery. It can get on quite well without. The logical analysis of scientific method is the outcome rather of disinterested curiosity than of an urgent practical demand. But in art and in morals the everyday practice and the consciousness of axioms and standards are held to be much more closely interwoven. I have never seen it stated that the thought of to-day is degenerate because we tend to be neglectful of the syllogistic rules, but it is constantly alleged, firstly, that we are to-day morally and artistically degenerate and disorderly, and secondly, that the reason is that we have discarded the traditional standards and have nothing with which to replace them.

In its crudest form at any rate the conception of a standard appears to involve a vicious circle. The process, as I see it, is as follows. We like or dislike a work of art and either do not feel sure of our own judgment or we find someone else in complete disagreement with us. Unable to reach any decision by concentration on the actual work we look around for some mediation and we finally refer the work to something else conceived independently of it, which, by analogy with the foot-rule, we call a standard. If the work is found to resemble or conform to this standard we agree that it is good, and *vice versa*. But if this standard is itself to be even remotely connected with beauty, it must have been reached through an examination of beauty. But, however elusive it may be, beauty does not exist in the Platonic abstract, it is always experienced in an individual setting, it is itself essentially something individual. Thus the standard must have been extracted from

some individual experience (or object of experience) admitted to be beautiful. Thus the would be instrument of judgment, the standard, itself presupposes an æsthetic judgment as the condition of its own coming into being.

From this fact two important consequences follow. In the first place, apart from the rather questionable profession of this new middleman, if, as is always alleged, there is such constant and violent disagreement on the subject of taste or intuition, which, as we have seen precedes and conditions the standard, then the validity of the standard will be equally a matter of disagreement. Being founded on the quicksand of taste, the standard enjoys only a counterfeit stability. In the late eighteenth and early nineteenth century, for instance, the favourite Italian painters were the Caracci, Caravaggio, Guido Reni. Later on these were replaced by Raphael, Michel Angelo, and Leonardo da Vinci, and still more recently there has been a decided reversion to the more primitive painters such as Duccio, Giotto, Masaccio and Antonello da Messina. Which of these provides the correct standard and tradition and how can it be demonstrated to be correct? In the second place the judgment by means of a standard is not itself æsthetic; it is a judgment of general likeness or similarity. Once we have accepted a rule as to the unities in drama or a standard in respect of subject in art generally, *e.g.*, that the subject must be dignified and "beautiful" in the restricted sense of the word, it is not difficult to detect divergence from or conformity with these criteria in particular works of art. The statement that Shakespeare's plays are not good art because they ignore the unities is no more an æsthetic judgment than the judgment that a certain footrule is faulty because it disagrees with the prescribed standard of measurement.

In a certain sense, of course, it is true that the æsthetic judgment also is a recognition of similarity or even of identity. The statement, "I think that this is beautiful," involves a

recognition that the new experience participates in the form or in the quality or qualities to which we have given the name of beauty. It is however a recognition, not by means of a middle term but by direct confrontation and a recognition of likeness in a particular direction, that of beauty.

This fact, therefore, does not upset the previous argument if the implied premise is accepted that the standard is not itself, taken in its bare generality, beautiful. The rule as to the unities is itself devoid of beauty; the recognition that a particular drama observes this rule is not therefore a recognition of beauty. Similarly with the more complex ideal standards which are obtained by combining and attenuating certain kinds of individual expression, for instance the ideal drawn from classic art which was circulated by Lessing, Winckelmann and other promoters of the neo-classic revival in the eighteenth century. Only if the standard were to coincide, without attenuation or deviation, with some particular work of art could it be regarded as itself beautiful. But to set up some particular work as a criterion for all others would mean to kill absolutely all original creation and to render the multiplicity of art purely numerical. And the vicio ~~a~~ circle of the standard as an independent objective criterion would be complete.

If, then, we consent to the final rejection of all standards which are obtained by the isolation and extraction of certain of the individual features of generally accepted masterpieces, what exactly is the effect of this upon criticism and aesthetics, what kind of form must they take and what kind of validity and persuasiveness will they enjoy? Emphasis has been laid on the individuality of beauty and on the need for what is called originality, for new creation, the bringing into existence of what was not there before and could not be anticipated. If this is a correct definition, it follows that no mediating criterion can be set up which will enable persons to perceive and appreciate the individual and new features of a work of

art. However objective and universally valid these features may be, they must be perceived immediately, we must grow into consciousness of them and judge them on their own intrinsic merits. It is not meant that the original work has absolutely no link with the past and is a discrete unit. On the contrary, only the artist who lacks any real inspiration eschews the past or what is called tradition, as a temptation and a danger. Genuine originality can dominate the past. Whether it can be said that in every new work there is in some sense immanent the whole preceding art, or only some portion of it, namely that particular style by which the artist has been influenced, is a problem with which I do not propose to deal here. But there are two points which I want to make. In being influenced by another artist, living or dead, an artist is not influenced by a generalization, but by the whole concrete and individual achievement. He does not merely study a method and a technique, he studies or rather one should say, merges himself in the whole inseparable unity of vision and emotion and technique. Secondly, however much of this old intuition reappears in the new work, if it is genuinely new there must also be felt, fused with and dominating the whole, a new vision or intuition. It is this new unity that cannot be anticipated by any standards, still less by any cruder rules of thumb. It is only arrived at after struggles and hesitation and the first stages of appreciation will be almost as slow and difficult as those of the actual creation.

On the face of it the above thesis might be thought to constitute a triumph for or rather a surrender to subjectivism, as it apparently leaves the field quite clear for the invasion of all kinds of personal and individual emotions, enthusiasms and tastes. It provides no sure road to agreement and permits everyone to rely on his own individual intuition. In fact it throws overboard the ideal behind the whole search for rules and standards. For it maintains that there ought not to be any fixed, static scientific code which will enable us to dispense

with the uncertain struggling and experiment of the individual judgment. But while it does fall back on taste, its relation to subjectivism depends altogether on the character which it considers this faculty taste to possess.

To come to the point quickly, it is precisely this maligned taste which has started this quest for an ideal code as well as all other quests for objectivity. For it is itself a striving after universality, after the best and highest of which it is capable. It is an unceasing movement towards agreement, even if no final agreement is ever reached. And it is due to the very eagerness with which agreement is sought that an attempt has been made to devise short cuts in the form of ready made rules, etc. If taste did not contain in itself the seeds of objectivity, if it were not itself the unfolding of these seeds, there could be no question of objective validity in art, because it would be hopeless to try to superimpose on an intractable material an epiphenomenal universality. Taste must either be through and through objectivity in the process of becoming or through and through wayward caprice. It is the custom to assume in disputes about taste that it is essentially the latter. But the only basis in experience for this view is the fact that tastes differ, "*chacun à son goût*." But so do opinions differ even in the sphere of science, which is considered to be the inner shrine of certainty and objectivity. To draw the direct inference from the fact of difference of tastes that "*de gustibus non est disputandum*" is a gross travesty of reasoning. The purely selfish and capricious taste is an *a priori* creation, the fact *a posteriori* is that taste is a constant effort at judgment and is precisely one of those matters about which everyone does dispute and argue and get incensed, however unreasonable this may be on *a priori* grounds. Nor does history by any means bear out the assertions of the subjectivists as to its unending cacophony in the region of art, productive neither of harmony nor intelligible discord. History shows a regular and unabated process

of sifting of good from bad and in each generation very much the same process recurs. There are always a number of artists who gain a great deal of ready praise, only to be dismissed later on as insipid or insincere or as betraying some other undoubted defect. And the great majority of them never reappear. The agreement about them is complete and enduring. Others, comparatively few in number, are either popular from the first and firmly established as big artists or gradually win recognition after a period of neglect. Occasionally some of these classics become temporarily submerged and all of them are liable to fluctuations in point of reputation. None are invested with a petrified and immutable value and about none can it be legitimately stated that the last word has been said. They are in fact still living and developing and each period of history has its own particular favourites; nevertheless the choice is made from a comparatively restricted number of survivors in the struggle of taste.

If therefore it is true, and I feel convinced that it is true, that taste both creative and critical is always a definite movement towards an ideal of rightness, of being not merely taste but also good taste, then the overthrow of the rigid pseudo-scientific ideal inspiring the rule-and-standard-makers does not mean anarchy and disruption. For the failure of the ideal is so to speak the failure of one of the foraging parties sent out by taste itself. What it does mean is that the quest must be continued unflaggingly and without hope of a final and closed system, a paradise of effortless and unchanging appreciation. But curiously enough this imagined paradise resembles very closely that very inferno of arbitrary and capricious tastes into which it is asserted that we shall be plunged. For if we suppress all the serious enterprise which animates our most genuine artistic impulses and surrender ourselves to the most superficial and reflex impulses, we shall attain just that effortless monotony which is the chief quality of the ideal. For these reflex impulses will be simply the final results of all

the serious efforts made in the past, and if no further efforts are made, no new reflex impulses will be required and so permanent agreement will be reached, because there will be no change. And did not our analysis of the standards and rules which were supposed to embody the ideal show that they were simply a residuum of past works of art, of past efforts, which is precisely what arbitrary, subjective taste also turns out to be? It is the usual case of the coincidence of opposites.

II.

But if the experiment with rules and standards has proved a failure and has had to be discarded, the process of experiment still continues. And the question still remains to be answered as to what exactly is the character of this process. The question has already been partly answered. It has been seen that the process is a creation of or a direct confrontation with a new experience the individual content of which cannot be anticipated beforehand. Further, both in the case of the artist and of the critic and appreciator an effort is being constantly made to attain some kind of truth of vision. What then constitutes precisely the difference between an effort which succeeds and one which fails? To put the question in a concrete form, there is a great deal of poetry written and published nowadays, much of which is very accomplished yet falls short of being genuine poetry. But it is something. What therefore is this something which is superficially so like poetry and yet is not poetry, and how do we know what it is and what poetry is?

It is conceivable that the most obvious and easiest answer is also the truest and completest. But I do not think that it actually is. The easiest answer is that good poetry has the quality which is called beautiful and that the bad poetry lacks it, and that this quality is just itself, unique and indefinable, and is either perceived or not perceived. If it is not perceived, the only remedy is to look or listen or read again

and again. This seems to me to be a dangerous half-truth. Even a unique and indefinable quality exists in the society of other indefinables and there must be some connecting links and relations between them all. To discover these relations is in a sense to define. Side by side with the category of beauty and often encroaching upon it there exists that of truth; and within truth there are normally considered to be the subdivisions of history, science, philosophy. If the differences and relations between these categories could be satisfactorily demonstrated, this might enable us to explain many apparent conflicts of opinion in art. Or again the view which has been maintained in this paper that art does not brook any rules or external standards, that it is essentially the creation of the individual and the new, is itself a partial definition of the unique element beauty.

Moreover, the theory of the simple mirror-like relation between consciousness and beauty does not provide any explanation of the difficulty experienced in getting a clear view of beauty, and of the many mistakes which are made in the attempt, or finally, of ugliness. It is at bottom based on an analogy between the consciousness of simple elements such as colours. Even these are not so simple as they are thought to be. Imagination has a good deal to do with our perception of colours, which are by no means devoid of the faculty of development and change. But to liken beauty to a colour, considered more or less from a physical point of view, is to assume that it can be plastered on to things, that a poem can have beauty superimposed upon it. Whereas, actually, the beauty is part and parcel of the whole process of thinking and aspiring and speaking which makes up the poem. The consciousness of beauty, in fact, is a constructing, a process as much as a mirror-like intuition, and this fact is recognized in current usage in the close connection which is assumed to exist between imagination and beauty. For the term imagination connotes a constructive process.

Modern criticism of art will be found to have penetrated beyond the mere dogmatic assertion of intuited beauty and ugliness; it is replete with pointed psychological explanations of what has happened in the poet's or the would-be poet's mind. It will contend, for instance, that he had a moral doctrine to preach, which should have been put into the form of an essay, or that he had no real emotion and was simply straining after the memory of one, or that he had produced a garbled imitation of someone else's work and had contributed nothing original of his own. Judgments of this kind bristle with concepts and arguments, and they do indubitably involve a definition of art and an explanation of its process. A theoretical scaffolding has been erected round taste, or rather discovered implied in its structure. But it is equally definitely not the old scaffolding of rules and standards. The latter interfered, so to speak, with the actual building material, they endeavoured to inflate the contingent and the particular into universality. The new definitions are also in search of universality, and in this sense they are also trying to anticipate. But they do not anticipate the content or the material. As contrasted therefore with rules and standards they might be termed principles. The following are two illustrations, one of a judgment by a standard, the other of a judgment involving a principle.

"One of the poems on which much praise has been bestowed is *Lycidas*; of which the diction is harsh, the rhymes uncertain and the numbers displeasing. What beauty there is we must therefore seek in the sentiments and images. It is not to be considered as the effusion of real passion; for passion runs not after remote allusions and obscure opinions. Passion plucks no berries from the myrtle and ivy, nor calls upon *Arethuse* and *Mincius*, nor tells of rough satyrs and fauns with cloven heel. Where there is leisure for fiction there is little grief."—*Samuel Johnson*.

"Can any candid and intelligent mind hesitate in determining which of these best represents the tendency and native

character of the poet's genius? Will he not decide that the one was so written because the poet *would* so write, and the other because he could not so entirely repress the force and grandeur of his mind, but that he must in some part or other of every composition write otherwise?"—Coleridge on *Wordsworth*.

Samuel Johnson has all the time at the back of his mind ideal standards in respect of rhymes, diction, numbers, and subject-matter. But Coleridge traces the direction in which Wordsworth's imagination is really moving and points out where it gets inhibited by mistaken motives. He analyses the forces working in the poet's mind and explains how in certain cases they do not make for poetry.

Now it is fairly evident that while a critical and psychological judgment of this kind does not presuppose any fixed standard in point of content or technical method it does presuppose some previous experience of art. Otherwise whence the conception of the poetic imagination? It could not have been obtained merely from reflection on the faulty work in question, since *ex hypothesi* the work lacks this quality. It must therefore have been derived from a study of good poetry. Undoubtedly the critic and the æsthetic philosopher must possess a real acquaintance with art, and the more intense and extensive this acquaintance is the more likely are their critical principles to be profound and pertinent. But here again the same question arises as in the case of the standard. Does the experience of good poetry precede the principle or *vice versa*, or are the two inseparable and born together? And if the experience, the taste precedes the principle, what is the function and value of the latter? Can it subsequently affect the taste or the actual creation, and if it cannot, how can it be said that the discovery of principles is the outcome of the effort of taste itself to attain to its own truth?

Evidently this would be misleading, and it would be equally misleading to speak, as I have done, of the old systems of rules

as being the actual creations of taste in its striving for universality. For these systems would be purely intellectualist constructions imposed upon taste, which can attain to universality by its own methods and does not require the assistance of any theory whatsoever.

Now this view is, I believe, generally accepted to-day as the true one, and it is only recently and with considerable hesitation that I have come to doubt its essential correctness. It is attractively neat and clear cut, with its absolute distinction between the two different faculties, the imaginative and the theoretical, and its assignation to each faculty of a separate independent task. It has been maintained with great weight and lucidity by the famous Italian philosopher, Benedetto Croce, both in his original *Estetica* and in his more recent *Breviario di Estetica*. And he gives a practical application of it in his essay on *Ariosto*, where he writes: "However unanimous, simple, and unrestrainable be the æsthetic approbation accorded to the poem of *Ariosto*, the critical judgments delivered upon it are just as discordant, complicated and laboured, and indeed this is one of those cases where the difference of the two spiritual moments, intuitive or æsthetic, the apprehension or tasting of the work of art, and the intellective, the critical and historical judgment, stands out so clearly as to seem to be almost spatially divided, so that one can touch it with one's hand. . . . It is one thing to read and sing the verses of a poet and another to understand him." This means that it is possible to appreciate and to create works of art without possessing any critical principles which are of their very nature explanations of a *fait accompli*. They neither create nor condition nor accompany taste, but follow upon it, for ever enshrouding it in a scaffolding of intellectual formula.

On the face of it, this view accords very well with that mass of general common-sense conclusions which we arrive at provisionally under pressure of practical exigencies and are rather too prone to designate as "facts of experience." When

the poet writes a poem he does not simultaneously construct a critical principle or an æsthetic system in a logical form, and when the critic reads the poem he first of all surrenders himself to it and afterwards develops his criticism. The theories of great artists are often negligible. There is little of real value in Leonardo da Vinci's essay on painting or in Hogarth's quaint theory of the line of beauty. Moreover, it is usually the second-rate artists who consciously put into practice æsthetic theories, and the majority of artists profess a fine contempt for all theory. The pathetic faith of the critic in the value and the importance of artists is not reciprocated by artists in respect of critics and criticism.

Of course, negatively, theories may be of the greatest value, that is to say in upsetting other theories. If artists are inclined to be influenced by wrong principles, and undoubtedly they are sometimes so inclined, the only way of putting them right is to convince them of the error in their theory. The modern world seethes with theories of art and it is difficult to see how any cultured nation can avoid producing them. It is not meant that they are needed in order to provide us with ready made judgments, but they are an inevitable part of any attempt at a systematization of values and an understanding of human society and history. If taste does not require æsthetic principles philosophical inquiry does; and the result reacts upon taste.

But a negative function also implies some positive function. It is scarcely possible to refute a theory without indicating, however vaguely, an alternative. A refutation of the theory behind modern *vers libre* would carry with it a defence and advocacy of metrical verse; an attack on the theory of cubism and of non-representative pictorial art would at the same time constitute an argument in favour of representational painting. Although the mere opinions that metrical verse and representational painting were proper art forms would, not in themselves provide a means for the production either of a poem or a picture, they might serve to canalize the imagination and

encourage a certain kind of creation and taste. And although artists may profess a contempt for theory, scarcely any artist nowadays has not indulged in a certain amount of speculative thinking. Nor is there any reason why artists should eschew it as a source of contamination and a peril. The true principles, if they exist at all, must at any rate be latent and implicit in a work of art even if the artist is not himself aware of them, and with greater self knowledge would come greater precision and power of self criticism.

Thus while it may be true that taste can be completely divorced from theory and logically precedes it in time, this divorce is logical rather than actual; it is to-day inoperative and a thing of the past. Even if at the moment of imagining or tasting we are not theorizing, at the back of our consciousness and in fact encircling our taste there will be found some theory previously conceived and awaiting confirmation, modification or development.

But is it really true that taste or imagination can be isolated in this manner and is it logically prior to any theory or principle? Certainly it does not follow upon theory, but it might be contemporary and complementary instead of being a precedent condition. It will have been observed that on the basis of the distinction drawn between taste and theory there are two parallel series of continuous changes or developments taking place; one covering the changes of art and of taste, the other covering the changes of theory and criticism. Frequently two further distinctions are drawn between creative and recreative taste and between criticism and æsthetics, I agree however with Croce in discounting these subsidiary distinctions. For that, between the creative act and the recreative taste, although concerning quite a real difference, nevertheless lies within the same kind of activity. And if criticism is to be altogether separated from æsthetics it will become simply a literary expression of taste and will therefore go over into that category. There remain therefore just the two series of

qualitatively distinct activities, of which the one, that of taste, is the condition of the other and is reconstituted in it, but on the other hand can exist by itself independently.

History, however, does not altogether corroborate this view. For it should be possible to trace in the course of history, first of all variations in taste and then corresponding adaptations in æsthetic criticism and theory. There should be periods of creative art and periods of criticism and reputations should be definitely established before criticism comes upon the scene with its explanations. But such hard and fast demarcations and periodic successions do not actually occur. Admittedly there have been constant variations both of taste and theory and admittedly each new phase of art involves some development and clarification of principle. But the interweaving and interlocking of taste and principle is so complex and intricate that it is impossible to say which started which. Moreover criticism is almost universally expected to guide public opinion in matters of taste. Taste, in fact, is not considered to be completely formed and organized until it has become articulate in a critical form. In his essay on Shakespeare Croce states that "criticism of Shakespeare, like every criticism, has followed and expressed the progress and alternations of the philosophy of art, or æsthetic." But it has also represented and constituted the progress and alternations of the imaginative appreciation of Shakespeare. Croce's own essay itself affords an admirable illustration of this, as a reviewer in the *Times Literary Supplement* pointed out with an unconscious irony. "Croce's implied thesis," he stated, "is that we cannot do without philosophy in the experience of art, and he maintains it by showing how philosophy removes obstacles to that experience. There are many who suppose that for sensibility to works of art we need nothing but sensibility, and that confronted with a work of art we must not think, but need only feel. . . ." Another and very pertinent illustration is to be found in Croce's essay on Corneille. At the opening he

remarks that "if there exists a poet who stands outside the taste and the preoccupations of our day (at least in France) it is Corneille. The greater number of lovers of poetry and art confess without reserve that they cannot endure his tragedies, which have nothing to say to them. The fortune of Corneille has declined more and more with the growth of the fame of Shakespeare, which has been correlative to the formation and growth of modern æsthetic and criticism." The whole burden of Croce's essay, which is an admirable piece of analysis, is that Corneille has a real, though somewhat elusive value and the merit of the essay is that by means of its lucid reasoning it focusses and enhances, if it does not actually awaken our consciousness of this value.

Stated briefly my suggestion is that the process imagination-principle or taste-explanation is not a passage from one independent activity to another, but a development which requires from the start the presence of both activities and in which a modification in one means a modification in the other. The imagination, or to use Croce's terminology, the individual is never an entity in itself and does not precede the universal or the consciousness of the individual character of the individual. It is always accompanied by a consciousness of a principle and a purpose, however terse and rudimentary. And this applies not only to the taste of the critic and generally of the public but also to the artist. The latter possesses a few working conceptions, he reduces them to an absolute minimum, he deliberately keeps them practically inarticulate, but they do exist in a conscious form and not merely latent and implied. In his work he emphasizes absolutely to the utmost the imaginative element and on his side the critic emphasizes to the utmost the universal element, the principles involved, the correlation of the work of art with the rest of life; nevertheless in doing so he attains to a clearer consciousness of the actual æsthetic value and significance of the imaginative work itself.

*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1, on
February 20th, 1922, at 8 P.M.*

Chairman: VISCOUNT HALDANE.

VII.—DISCUSSION: THE IDEALISTIC INTERPRETATION OF EINSTEIN'S THEORY.

By H. WILDON CARR, T. P. NUNN, A. N. WHITEHEAD, and
DOROTHY WRINCH.

(The papers have not been written consecutively as in a Symposium. The thesis stated in the first paper has been submitted to the other writers, who have formulated independently their criticisms of it.)

I.—*By* H. WILDON CARR.

Thesis.

Einstein's theory is a scientific interpretation of experience based upon the principle of relativity. This principle is in complete accord with the neo-idealist doctrine in philosophy, and in complete disaccord with the fundamental standpoint of every form of neo-realism.

Explanations.

So far as my thesis is concerned, I make no distinction between the special and the generalized theory of relativity. The principle of relativity is not a theory of the nature or origin of the subject-matter of the natural sciences, but a principle by which a scientific reality can be constituted and laws of nature formulated, without any assumptions, hypotheses, or presuppositions, whatever, as to the substance or cause underlying sense-experience. The principle of relativity is therefore in the literal meaning of the terms anti-metaphysical and methodological.

Neo-realism I take to be the philosophical standpoint that

knowledge requires us to presuppose existence, and that in some sense a universe exists in space and time, the entities within which are discoverable by minds, which themselves are accorded a place therein on equal terms with the entities they discover.

Neo-idealism is the philosophical standpoint that reality in its fundamental and universal meaning is mind or spirit. Mind, in this universal meaning, is not an abstract thing opposed to nature, or an entity with its place among other entities in space and in time, it is concrete experience in which subject-object, mind-nature, spirit-matter, exist in an opposition which is also a necessary relation. Apart from their relation the opposites are meaningless abstractions. Experience does not present us with entities existing independently of their relation, as, for example, men (subject) who see (external relation) the sun (object), but with concrete wholes, as, for example, eye-seeing-sun. Experience is analysable but cannot be dissociated into constituent elements. Moreover, experience is essentially activity and process, not passive contemplation. The standpoint of neo-idealism, therefore, is thought thinking, mind as pure act, reality as eternal history.

Neo-idealism therefore differs widely from the empirical idealism of Berkeley according to which the objects of the external world exist only as ideas in the perceiving mind. It differs also from the transcendental idealism of Kant according to which mind gives form to the matter presented to it, which matter is therefore only known as phenomenon though existing as noumenon. It comes much nearer to the idealism of the seventeenth century, to Descartes's principle, "I think therefore I am," to Spinoza's infinite modes of God, and especially to Leibniz's system of the monads.

Argument.

The principle which Einstein follows in physics is based on the recognition that the phenomena which constitute its subject-matter are presented in the form and only in the form of sense-

experience. Ultimately and fundamentally the qualities of physical objects are sensations. In this he avows himself the follower of Mach.

A science of physics implies an objective world common to individual subjects of experience, and the intercommunication of subjects. To constitute such a science the only safe rule to follow is to deduce everything from empirical facts and to eschew transcendent causal agencies. In this scientific principle of economy Einstein also follows Mach. The application of it leads to the principle of relativity.

The classical mechanics laid down as the necessary basis of science the affirmation of an existence independent of sense experience to which the subject of experience referred his sensations. The sensations, and perceptions engendered by them, were then taken to be subjective appearances and science to be truth concerning the reality which in its existence was independent of the appearances by which it was revealed.

The principle of relativity completely reverses this method. It accepts what were called the appearances as themselves the reality and as the only reality with which science is concerned. It affirms that to constitute a common object it is not necessary to place the existence of that object outside experience and independent of it, all that is necessary is that one individual should be able to refer to an object in his experience which corresponds point to point with the object in another individual's experience. There cannot be between the two objects a substantial identity, because everyone's experience is his own and not another's; and there is no need to assume a causal identity. All that physics requires is correspondence in the object and intercommunicability in the subject in order to work out uniformities.

The principle of relativity therefore rejects in physics the metaphysical principle of materialism which presupposes an objective transcendent cause of experience. It equally rejects in mathematics the metaphysical principle of intellectualism

which presupposes pure reason, enlightenment, discernment, as the transcendent subjective cause of experience. That is to say, it rejects the view that in mathematics the mind, endowed with reason, contemplates eternal truth. This takes the form of the denial of a universal geometry.

Following Riemann, Einstein rejects the method of founding geometry on the properties of absolute space, whether assumed as the real framework of the universe or postulated as a necessary ideal. The rejection is made on the empirical ground that every spatial system is in fact relative to a degree of freedom, and this degree of freedom cannot be determined for any system from within. Every spatial system therefore is absolute from the standpoint of those attached to it. The type of equation which Einstein uses in geometry is consequently the exact opposite of that of Euclid. For a point to be common to two spatial systems the co-ordination will be the same but the axes of co-ordination will be different in each system. The outcome of Einstein's method is to replace the conception of an infinite universe having absolute direction in space and time, with the conception of a universe which is finite but yet unbounded. But it is the constitution of this new universe which is important for the argument.

The universe is a four-dimensional space-time continuum. It is constituted of events. The point-instant of an event is determined in its position in the universe by the four co-ordinates—three of space, one of time. But the axes of co-ordination are different for every system in relative movement, uniform or non-uniform. There is no absolute space-time system or, what is the same thing, every space-time system is absolute for those attached to it. Consequently in the universe there is neither simultaneity nor fixed spatial relation in any meaning which will imply universality. The world-line or track of any moving point-event is, when co-ordinated from its own standpoint, a straight line, whatever curvature or deformation it may have in other systems.

In this argument I set aside the empirical reason for rejecting absolute space-time-matter, *viz.*, the negative results of the experiments. I also set aside the very important application of the principle of relativity in biology and the strong support which biology gives to the confirmation of the principle. I confine attention to the principle of relativity itself as formulated for physics and for mathematics. That principle in appealing to experience must of necessity, and in fact does, recognize the subjective-objective constitution of experience. It is this which distinguishes the empirical from the materialistic principle. It also recognizes that every space-time system must of necessity have, and in fact has, its subjective, active, co-ordinating, centre and its subjective axes of co-ordination. This means that so far as anything is real, that is, exists, that is, is thing-in-itself, it is a centre of perceptive activity, co-ordinating from the standpoint of itself as absolute the universe mirrored in it.

This I claim is in essentials the Leibnizian conception. The principle of relativity proposes in science precisely the methodological reform which Leibniz proposed in philosophy when he said, "The monads are the real atoms of nature."

II.—By T. P. NUNN.

The principle of relativity, says Professor Carr in his opening paragraph, is "in complete disaccord with the fundamental standpoint of every form of neo-realism." If this uncompromising pronouncement were true, some of us should feel very uncomfortable. I confess that it has made me scan Professor Carr's argument anxiously to find the places where realism comes into such unhappy collision with the doctrine of relativity. I hope that it is not the blindness of prejudice which has prevented me from seeing them, nor an envious spirit which suggests that Professor Carr has secured

Einstein's exclusive patronage only by misrepresenting his opponents' character.

I hasten to admit that his formal definition of the standpoint of neo-realism is unobjectionable. What I complain of is that in order to prove the incompatibility of that standpoint with the principle of relativity, he implicitly identifies it with the standpoint of materialism and the "classical mechanics." For as a matter of fact, the rejection of the materialism of the older physics is the very essence of the neo-realist position. From the beginning neo-realists would have nothing to do with the notion that sensations are mental events caused by "physical objects," but (like Einstein) declared that physical objects are but syntheses of, or constructs from, sense-data. Moreover (again like Einstein) they have taught explicitly that the varying appearances of the "same thing" to different observers are not diverse mental reactions to an identical material cause, but are correlated sense-data or "events" belonging to a single historical series. In other words, they have professed the view which Professor Carr seeks to convey by his explanation that what makes an object "common" is point to point correspondence between the experiences of different observers. Thus, before the doctrine of relativity had risen above their horizon, neo-realists had already gone a long way to meet it. Some (*e.g.*, myself) were restrained from going farther because they shrank from breaking with the traditional beliefs about space and time which they shared with the idealists of their day. But in 1914 Mr. Bertrand Russell carried neo-realism right into the camp of the relativists by declaring that "two places of different sorts are associated with every sense-datum, namely the place *at* which it is and the place *from* which it is perceived."* And Professor Carr should take particular interest in Mr. Russell's further statement

* Russell, *Mysticism and Logic*, p. 158.

that this idea leads to a theory "closely analogous to Leibniz's monadology."

Professor Carr has probably overlooked these facts. If he has not, how can he maintain in face of them that neo-realism is in complete disaccord with the theory of relativity? Only, I submit, by reading into that theory a tenet which has no necessary place in it, but happens to be the crucial point of difference between the creeds of idealism and realism. The principle of relativity, he says, "must of necessity, and in fact does, recognize the subjective-objective constitution of experience," and "also recognizes that every space-time system must of necessity have, and in fact has, its subjective active co-ordinating centre and its subjective axes of co-ordination." If these statements are meant (as no doubt they are) to mark an essential difference between the new physics and the old, I must respectfully deny their truth. The physics of Einstein takes no more account of the "subjective" in experience than did the physics of Newton. It is true that expositions, especially popular expositions, of the doctrine of relativity make numerous references to the "observer." But that is not because the Einsteinian physics is more "empirical" than the Newtonian; it is simply because the older physicists believed that all observations, by whomsoever made, could be referred to a single space-time framework, while the modern physicists know they cannot. The frequent mention of the observer is merely an expository device to keep this vital fact before the reader's mind. When we examine the actual substance of the new physics, we find no more "subjectivity" in the equations of Einstein than in the equations of Newton. In other words, the modern view of the physical universe, while implying, as all science implies, that observations have been made, is as little committed as the classical mechanics to any special doctrine about the nature and import of experience.

For confirmation of this statement I refer to the recent writings of Professor Alexander and Professor Whitehead,

writings with which a company of philosophers will feel more at home than with the technical applications of the theory of tensors. Both these authors have given accounts of space, time, and matter, which are in consonance with the principle of relativity, and both have been scrupulously careful to avoid confusing the issue by irrelevant references to "experience." That is to say, they have dealt with nature, so to speak, relativistically, and yet have treated it (I quote Professor Whitehead) "as a complex of entities whose mutual relations are expressible in thought without reference to mind."

It will be noted that I do not return upon Professor Carr the charge he brings against neo-realists. I am not concerned to assert that the principle of relativity is incompatible with idealism; only to deny that it is incompatible with neo-realism. The historical facts I have mentioned tempt one to take up a more positive position than this, but I refrain from exploiting them. The truth, as I see it, is that the principle of relativity leaves the issue between idealism and realism exactly where it was. It has furnished important new truths for the rival sects of philosophers to work into their systems, but it has produced no final criterion of their claims. The quarrel must be continued on the old grounds.

III.—By A. N. WHITEHEAD.

The necessary association of the physical theory of relativity with any form of idealistic philosophy is not at all evident to me. Why should a realist be committed to an absolute theory of space or of time? Again, why should he be constrained to reject any assimilation of space and time?

A relative theory of space necessitates that we admit the spaciness of the ultimate substance of nature; and a relative theory of time necessitates that we also admit the time-iness of this substance. Accordingly the ultimate fact of nature must,

on this theory, be an event. So far, I agree with Professor Carr. But I cannot see why a realist should choke at having to swallow events. There is nothing wrong with them on his theory. In fact, my own doubts as to any form of idealism come from the very difficulty of conceiving any very close association with mind of bygone ages, when the granite was formed or when the sun first blazed. We now cognize them by their direct relatedness in space and time with events which we directly perceive as qualified by contingent characters. But the contingent characters of the remote events are only surmised by us as the outcome of doubtful inferences. Yet we know that some such characters they must have had. Accordingly we know of events whose connexion with any mental process, as we know it, appears to be doubtful, incomplete, and extremely unessential to them.

That is my reason for being very shy of leaning too heavily on mind in any endeavour to express the general character of reality. It comes to this, that there has been so much happening, and that, so far as we know, there is not enough mind to go round.

In fact, relativity actually removes a difficulty from the way of the realist. On the absolute theory, bare space and bare time are such very odd existences, half something and half nothing. They always remind me of Milton's account of the Creation, with the fore-paws of the lions already created and their hinder quarters still unfinished—

"The tawny lion, pawing to get free
His hinder parts, . . ."

It seems so much simpler to sweep all this odd assortment of existences into the mind; and then all their contents have to follow them into the same dust-bin as being nothing else than the outcome of the diseased mentality of existence. The point that I am endeavouring to make is that relativity lends a uniformity to the type of existence as disclosed in sense-

awareness, a uniformity very welcome to the realist, who was rather perplexed by the curious entities he was committed to.

Again, the modern rejection of a unique meaning for simultaneity is all to the advantage of the realist. The realist was—at least he ought to have been—very puzzled by the idea of the past or the future as non-existent. For the modern relativist all events, *quid* events, belong to the same order of reality. Where they differ is that certain contingent characters of an event can only be expressed in terms of its relations to contingent characters of other events belonging to its essential past, and do not depend upon such characters of events which either are co-present with it or belong to its essential future. The characters I am thinking of are the things immediately perceived as implicated in events. I am not thinking of the conjectural characters of physical science, which stretch away into the future and are called the laws of nature.

Unless these laws of nature are sufficient to determine all conditions for appearance in the future, there is nothing in the character of any event A or of events preceding A, which necessitates any apparent character to be attached to an event, B, in the essential future from A. Accordingly, unless for other reasons he desires to be so, the realist is no any more bound to adopt determinism than he was before, but again he has got rid of puzzling distinctions among realities.

I hold that so far as modern relativity has any influence under the problems of realism, it is all to the advantage of such philosophical systems.

The fact that different observers may cognize different sets of relations as the spatial relations within nature and different temporal relations as the temporal relations in nature creates no difficulty. The relations observed are in every case dependent upon what happens to the body of the observer within nature. All the relations disclosed are relations between natural entities, and the conditions which determine the choice are also particular characters of relations between natural entities.

The whole set of conditions lies within nature and yields no ground for impugning its reality. To give point to Professor Carr's argument on this heading, he ought to show that the conditions lie without nature. For example, he should show that a man in love necessarily measures space and time differently from a man given over to avarice.

The realist's main difficulty is, however, not removed. Nature is the apparent world ; but after all, appearance is essentially appearance for knowledge, and knowledge is a different order of being from mere nature. There is a desperate attempt by bifurcating nature into appearance and a cause behind the veil to save for causal nature independence from mentality. For reasons which I have argued elsewhere, I do not believe that such bifurcation is tenable. Accordingly it would seem that nature is an abstraction from a more concrete reality which Lord Haldane calls knowledge. To a large extent I am here in agreement with Professor Carr. He writes "experience is analysable but cannot be dissociated into constituent elements." By this I understand him to mean that the constituent elements of the analysis are more abstract than the experience. But Professor Carr in claiming this conclusion from neo-idealism, pushes me over the edge where I do not want to go. I am haunted by the seeming indifference of nature to mind, which I discussed at the beginning of this paper. Lord Haldane's term "knowledge" also rather alarms me. I should like him so to explain it as to tone down its sheer mentality, in fact to make it look more like old red sand-stone.

What I really doubt is whether there is any term sufficiently comprehensive to embrace the ultimate concrete fact. It seems impossible to obtain a term with positive content which does not thereby exclude. But in speaking of ultimate fact there is nothing to exclude. Our analysis is always by way of abstraction, thus we have Bergson's urge of life, Haldane's knowledge, Berkeley's mind, and so on. Some of these terms are better than others as being less misleading, but they are

all too narrow. Against the background of the becomingness of existence we can only project the various abstractions which are the product of the differing modes of analysis—

The ages pass with splendid fires
Trailing along their shadowy tread.
Behind the curtain of the dead
Life sits alone and still desires.

IV.—*By* DOROTHY WRINCH.

The theory of relativity is a part of physics and shares with other theories which make up modern physics certain well-understood and well-established assumptions. The theory is of outstanding interest in physics mainly because of the intricacy of the deductions which are involved, but in no respect whatever is the theory "idealistic" or "realistic" in any sense in which any other branch of physics is not. The question before us is then, in fact: Is physics in accord with the idealistic interpretation of the external world?

The Legitimacy of Analysis.

High up on the list of assumptions which form the foundations of physics and of the theory of relativity is the assumption of the legitimacy of analysis. In science we believe that the facts with which we deal are capable of analysis; we believe that the facts have constituents in the sense that identical terms can form part of different facts. This identification of terms, occurring in different facts which come to our notice, is the main stimulus to scientific thinking. Unless the same term arrested our attention in several different complexes of fact, we could not attempt to build up science. For in science we collect together the facts at our disposal with a view to discovering general propositions. A large part of scientific thought consists in the building up of probability inferences of various kinds. The material required for inductive inferences for example, is propositions of the type—

(1) a, b, c have the properties f and g , and z has the property f , and this proposition enables us, under certain circumstances, to assign a probability value to the proposition

(2) z has the property g .

The theory of relativity is no exception in this respect. The powerful generalization that

(3) $m = m_0/(1 - v^2/c^2)^{1/2}$

where m is the mass, v the velocity, c the velocity of light, and m_0 is the mass when at rest, is essentially of the same type. General propositions of this kind can have no possible meaning unless the facts of the external world are analysable. For, if we consider the meaning of this proposition, it becomes plain that in asserting it we are making an assertion of the form,

(4) Whatever a may be, if a has the property f it also has the property g .

All propositions involving physical concepts such as mass, velocity, or length, presuppose the legitimacy of analysis in the same way.

The assumption of the legitimacy of analysis, as I have interpreted it, is very closely allied to the assumption of the externality of relations.

The Nature of Concepts.

Now in the proposition (3) which gives the relation between mass and velocity in the theory of relativity we are employing concepts. The status of concepts is a matter upon which physics takes a firm stand. Concepts are essentially constructions in the sense that propositions in which they occur are universal propositions of the form (4). And writing C for the terms which have the property f , and D for terms which have the property g , this proposition reads,

(5) If x is a C it is also a D,

or alternatively,

(6) C's are D's.

Moreover, science which indeed seeks to correlate properties, as in the proposition (4) above, must attach a meaning to the

resulting propositions which is relevant to the external world. The deductions to be drawn from these generalizations of relativity deal with particular terms, and the whole meaning for physics of propositions such as (6) or (3) is that when a term which is a C occurs, we can say that it is a D also; or to take the specific example of (3), that when a body is moving with velocity v , we may substitute for its mass in terms of this velocity according to (3), and so deduce other particular facts about, for example, its path in space. The theory of relativity takes as its data the particular facts of the external world and arranging and collating them in general propositions—by means of probability inference—interprets its results in terms of the deductions which can be made from certain facts which are known, to other particular facts which may or may not be known. Correlation between different facts is the only aim of science, and it would certainly be true to say that it is correspondences between data which alone are required (p. 125). The reality of these facts which form the material of physics is not questioned. They are the reality with which science is concerned and indeed the only reality. And the assertion that these facts are the only reality, leads at once to the view of the concept taken by science. Concepts are employed merely as abstracts to facilitate the arrangement and collation of the particular facts which are themselves the only reality.

The advances made by the theory of relativity may be considered in the light of these remarks. The concept of mass, for example, has been fundamentally modified. Logically speaking, it was found that the facts in question could be grouped more satisfactorily in universal propositions of a different form and the concept—the class name for terms having certain properties—was amended. A second example may be taken. The concept of length, introduced at a very early stage in physics has been severely modified. In Weyl's developments and in the work of Eddington, the concept of length is used in such a way that the unit of length is a function of the three space co-ordi-

nates and of the time co-ordinate. In fact the unit of length is not constructed for all times and all places but on the contrary, each point of space time has its own gauge system.

In the work of Eddington which has put forward the latest developments from a strictly methodological point of view, an assumption is put forward called the "Comparability of Proximate Relations." This postulate is introduced to bridge the gap between the gauge systems of discrete points and asserts the comparability of neighbouring gauge systems. It is introduced at present tentatively, as the simplest way of building up a common system from the gauge systems of the points of space time, which physics seems to require. From the standpoint of physics the introduction of this assumption or of a similar one is entirely justified.

Conclusions.

It must be mentioned explicitly that the correlation of characters is the most important business of science, for the proposition of relativity and other branches of science can all be reduced to propositions of this kind. If "causality" is involved in science, it must accordingly be present in propositions of these types: otherwise it is irrelevant. In making assertions as to the nature of "cause" employed in relativity theory, one should, I think, reduce the propositions under discussion to their fundamental forms. It will then be a comparatively simple matter to decide the question. But I would like to stress the fact that whatever is said about the subject must be reduced to questions of the correlation of characters, and that indeed there is no further question of whether relativity uses the notion of "substance or cause underlying experience" (p. 123).

The constructed concepts of relativity enable us to group together masses of facts and the investigation of the relative merits of alternative concepts for this purpose—this constitutes a large part of the work of Weyl and Eddington—is an important part of scientific theorizing.

To its view that the concept is an abstraction, science will allow no exception. The mind is not in a privileged position, but like other concepts is constructed to facilitate the description of the world and the correlation of facts. It is part of the business of psychology to discover all the factors which are involved in the propositions in which the concept occurs. But, formally and methodologically, we have here a study not essentially different from the investigation of the factors involved in the notion of mass in physics. But it cannot be allowed that the mind is concrete experience (p. 124) in any sense in which the assertion would be inconsistent with the abstract character of the concept. In psychology, as in other branches of physics, the sensations are the data from which we start, and progress consists in linking together different facts of sensation.

The theory of relativity has made great advances because it has put forward important modifications of the concepts currently employed in science. It has in particular suggested that the older idea of length which attempted to build up quantitative physics on the basis of one unique unit of length is not the most useful concept to employ. It substitutes a concept of length which, though it depends on the precise neighbourhood of space time in which it is applied, does not imply any change in the status of the mind as used in science. New variables are involved in propositions about length, beyond those previously thought to be relevant. The recognition that the temperature was a factor to be considered in propositions about length was an advance, methodologically of the same type. It would therefore, I think, be unjustifiable to conclude that the new concepts of relativity allow any deductions whatever to be made as to the nature of mind. The theory of relativity and physics as a whole takes up its stand on the reality of sensations and gradually constructs the concepts which are most suitable expressions of the correlations between the various facts of experience.

*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1,
on March 6th, 1922, at 8 P.M.*

VIII.—THE LOGIC OF THE VEDĀNTA.

By S. N. DASGUPTA.

THE word Vedānta means literally the concluding parts of the Vedas* also called the Upaniṣads, of which the earliest ones were composed probably about 500 B.C. An extremely condensed exposition of the purport of these earlier Upaniṣads was attempted by Būdarāyana probably about 200 B.C., and this work is called the Vedānta sūtras. It was commented on and interpreted in totally different ways by many philosophers of later times. The earliest and best-reputed commentary now available is that which was attempted by Śaṅkara in the eighth century A.D. The view expressed by Śaṅkara as the correct interpretation of the Vedānta sūtras and the Upaniṣads was further elaborated and supplemented in dialectical arguments by succeeding generations of his followers down to the seventeenth century A.D. It is the view of the Vedānta propounded by Śaṅkara and his followers which will form the subject matter of this paper. I shall try to show the course of the development of the logical position of the Vedānta in its different stages of growth in relation to, and in contrast with, the Buddhist philosophy and the realism of Nyāya-Vaiśeṣika philosophy, with which it was always contending.

Though individual exponents from sectarian interests have always held that the Upaniṣads preach a consistent and fully developed system of philosophy, it is by no means certain that

* The Vedic literature comprises of the four Vedas (collections of hymns), the Brāhmaṇas, ritualistic commentaries on the hymns, containing many kinds of other speculations, and the Upaniṣads (secret doctrines) which are separate treatises forming the concluding portions of these Brāhmaṇas.

such a contention can be justified. But a study of the Upaniṣads makes it clear that certain lines of thought are very much more emphasized than others. Śaṅkara laid emphasis on these, and sought to explain away all other texts that came in conflict with them. We, therefore, start from these as the nucleus of the Vedānta thought. The *mean* feature of this thought is a sort of inspired belief or conviction of the Upaniṣad sages that the highest ultimate and absolute truth, the Brahman (lit. great) is the inmost self in us. This truth is not arrived at by a process of logical reasoning, but it is realized as the inspiration of the moment. But what is this self that the Upaniṣads describe as the highest and supreme reality? In a certain passage five kinds of self are distinguished, self as gross material body, self as vitality, self as will, self as conscious states, and self as bliss, and it is held that this last is the true self, true reality. The Upaniṣads do not seem to think that any definition of this ultimate truth is possible, for it is beyond everything else and all else falls far short of it. It can therefore only be pointed out as not this, not this, but its positive nature cannot be explained in terms of anything else. The story is told that a certain person went to a teacher of Vedānta and wished to be instructed about the nature of this highest truth, but the teacher did not say anything, and when the pupil repeated his question for a number of times, the teacher replied that he (the pupil) could not understand him though he (the teacher) was instructing him from the very beginning by his silence, for truth was silence. It may no doubt seem very mystical that no positive definition of the highest reality could be given and that it should be regarded as inexpressible. But the Upaniṣad hypothesis was such that there was no way of defining the highest reality by the enumeration of any of its characteristics. The highest reality was not a matter of mere abstraction for it was felt as immediate and concrete, and was believed to be directly given in experience. The difficulty of giving a definition was of a methodological character, for as it

was the highest and the absolutely unchanging truth, and as it could not properly be translated and interpreted in conceptual terms, it could only be pointed out negatively as "not this" "not this" until by such negative exclusions the attention could be directed to the right experience of this highest self which though ever existent yet often remains unnoticed owing to our lack of training and want of knowledge as to where it may be looked for. Yet no mystical absorption, meditation or method is described by which this reality can be experienced : it is not produced by any particular course of conduct or process, for it is ever existent in all our experiences and this alone is the highest truth and when this is known all is known. It is said that just as when we know clay, we know all that is made out of it, or just as when we know iron, we know all that is made out of it, so when the Brahman, the self, is known everything is known. What we call a jug or a plate are but names and forms only, the truth in them is the clay. The forms and names have no reality apart from the material, and so nothing else has any reality apart from Brahman ; all else are but names and forms. But the status of the world as a whole or of any other thing in relation to Brahman has never been seriously discussed in the Upaniṣads. The main emphasis was put on the supreme reality of the Brahman and the question of the philosophical status of the world did not attract much attention and was often simply passed over. The main criterion of the real and the true was that it should be absolutely unchangeable, and nothing else was considered to be so except the self. The sage Yājñavalkya says thus, "He the ātman is not this nor this. He is inconceivable, for he cannot be conceived : unchangeable, for he is not changed : untouched, for nothing touches him ; he cannot suffer by a stroke of the sword for he cannot suffer any injury" (*Bṛ.*, IV, 5, 15). Again in the Kāṭha Upaniṣad it is described as "That which is inaudible, intangible, invisible, indestructible, which cannot be tasted nor smelt, eternal, without beginning or end, greater than the great, the fixed" (*Kāṭha*, III, 15).

This inmost essence has sometimes been described as pure subject-objectless consciousness, the reality and the bliss. He is the seer of all seeing, the hearer of all hearing and the knower of all knowledge. He sees, but is not seen, hears but is not heard, knows but is not known. He is the light of all lights. He is like a lump of salt with no inner or outer, which consists through and through entirely of savour. This body is the support of the deathless and the bodiless self. The self as embodied is affected by pleasure and pain, but pleasure and pain do not touch the bodiless self." Everything comes out of it and returns back to it. Thus, in *Mund* 1.1.7, it is said—

“As a spider ejects and retreats (the threads)
 As the plants shoot forth on the earth
 As the hairs on the head and body of the living man,
 So from the imperishable all that is here.
 As the sparks from the well-kindled fire,
 In nature akin to it, spring forth in their thousands,
 So, my dear sir, from the imperishable
 Living beings of many kind go forth
 And again return unto him.”

(Deussen's Translation.)

It is said that in this infinite and true self there is no difference, no diversity, no *meum* and *tuum*. It is like an ocean in which all our phenomenal existence will dissolve like salt in water. “Just as a lump of salt when put in water will disappear in it and it cannot be taken out separately, but in whatever portion of water we taste we find the salt, so, Maitreyī, does this great reality infinite and limitless consisting only of pure intelligence manifesting itself in all these (phenomenal existences) vanish in them, and there is then no phenomenal knowledge” (*Bṛ.*, II, 4, 12). It is difficult to ascertain the logical position of this Upaniṣad view. The main basis seems to be the assumption that that which is absolutely unchangeable is the highest reality; the sages regarded the self as unchangeable, and therefore considered it to be the highest reality. They distinguished the self as unchangeable

from the self that thinks, feels, and wills; but they could not define it, as they thought it could not be translated or expressed in our conceptual experiences.

It is exactly at this point that the criticisms of Pāli Buddhism deserve special consideration. It definitely challenges the Upaniṣad doctrine of the self and asserts that there is no self; what appear as self are but changing sense-data, feelings, mental states, concepts, and consciousness; it is wrong to suppose that in any of our experiences we ever perceived the self, for we are, at any particular moment, aware of certain sense-data, mental states, or emotions, and beyond them there is no abiding person or self which can be pointed out as the unchangeable reality. Thus the Buddha is represented in the *Samjutta Nikāya* as saying, "When one says 'I' what he does is that he refers either to all the *khandhas* (groups of mental states, sense-data, emotions, etc.) combined, or any one of them, and deludes himself that that was 'I.' Just as one cannot say that the fragrance of the lotus belongs to the petals, the colour, or the pollen, so one cannot say that the *rūpa* (sense-data) is 'I,' or that the *vedanā* (feeling) is 'I,' or any of the other *khandhas* is 'I.' There is nowhere to be found in the *khandhas* 'I am.'" We can never affirm that there is anything permanent anywhere, there are only the phenomena such that some of them happening others also happen. With the Upaniṣads the absolute and unchangeable ground and cause of all things is the self, and all else are but mere names and forms, but Buddhism points out that what we experience are but the changing phenomena which are so related that when some of them happen, depending on them others also follow. Apart from this causal sequence of phenomena nothing else is experienced which can be pointed out as being permanent. The nature of these phenomena was further investigated by Nāgārjuna (100 A.D.) the great Buddhist dialectician, who sought to prove that all phenomena are self-contradictory and have therefore no essence, truth, or reality in them. He took, one by one, all the

important categories that were then known to the Buddhists and showed that they were inexplicable and self-contradictory. To take one example, we find that Nāgārjuna denied the possibility of origination or the happening of an event. All origination is false, for a thing can neither originate by itself nor by others, nor by a cooperation of both, nor without reason. For if a thing exists already it cannot originate again by itself. To suppose that it is originated by others would also mean that the origination was of a thing already existing. If again, without any further qualification, it is said that depending on one the other comes into being, then even from light we could have darkness ; since a thing could not originate from itself or by others, it could not also be originated by a combination of both of them together. A thing also could not originate without any cause, for then all things could come into being at all times. In this way he proceeded to demonstrate that there is no truth, no essence in any phenomena that appear, and as the phenomena have no essence they are neither produced nor destroyed ; they really neither come nor go. They are merely the appearance of *māyā* or illusion. This voidness does not mean pure negation, for that is relative to some kind of position. It simply means that none of the appearances have any intrinsic nature of their own. His disciple Āryyadeva also followed his line of reasoning, and held that whatever depends for its existence on anything else may be proved to be illusory ; all our notions of external objects depend on space perceptions and notions of part and whole, and should therefore be regarded as mere appearance.

It may not be out of place here to mention that, in spite of the great difference between the positive parts of the conclusions of Mr. Bradley and Āryyadeva and Nāgārjuna, there is much that is common between them, so far as the refutation of the appearance is concerned. The main principle according to which Āryyadeva seeks to distinguish the illusory from the real, is that the former depends for its existence on something else,

and is not self-contained or self-subsistent. Mr. Bradley also says, "I conclude that what is real must be self-contained and self-subsistent and not qualified from outside . . . whatever is real must be qualified from itself, and that means that so far as it is real it must be self-contained and self-subsistent."* Nāgārjuna examined some of the most important categories and showed that in whichever way they were interpreted, defined or expressed, they would have to depend on others for making themselves understood, and these again would depend on others, and so on; in whichever way they are examined they are fraught with contradictions. Mr. Bradley also follows the same method in showing the contradictions in the appearance, but he contends that since each and every appearance is dependent on others, individually each is false, but when they are taken in the totality we have the reality—

"Thus every part is full of vice,
Yet the whole mass a paradise."†

With Nāgārjuna this alternative does not arise at all, for if each and every phenomenon is essenceless and illusory, there is no possibility that all these individual illusions could give us a reality, for if they are individually illusory and if the fact of there being a collection is illusory, we can never have a reality out of them.

We have seen that the Upaniṣads asserted that the highest reality was the self, but they did not demonstrate how all the worldly phenomena could be regarded as unreal. Buddhism, as propounded by Nāgārjuna, not only demonstrated the illusory nature of the self, but showed that nothing whatever could be said to be real as things are mutually dependent, and hence fraught with contradictions. But the question arose that if such were the case, then how could the rise of the phenomena be explained at all? The Vijñānavādin (idealistic)

* *Appearance and Reality*, p. 570, 1908.

† *Ibid.*, p. 571.

Buddhists tried to explain them on a wholly idealistic basis. They held that all qualities and substances were but imaginary constructions of our minds. There is no movement in the so-called external world as we suppose, for it does not exist. We construct it ourselves and then are ourselves deluded into thinking that it exists by itself. Our understanding is composed of two categories called the *pravicayabuddhi* and the *vikalpalakṣaṇagrahābhīniveśapratīṣṭhāpikābuddhi*. The *pravicayabuddhi* is that which always seeks to take things in either of the following four ways, namely, that they are either this or the other, either both or not both, either are or are not, either eternal or non-eternal. But in reality none of these can be affirmed of the phenomena. The second category consists of that habit of the mind by virtue of which it constructs diversities and arranges them in a logical order of diverse relations of subject and predicate, causal and other relations. He who knows the nature of these two categories of the mind knows that there is no external world of matter, and that they are all experienced only in the mind. There is no water, but it is the sense-construction of smoothness that constructs the water as an external substance; it is the sense-construction of activity or energy that constructs the external substance of fire. In reality there is nothing which is produced or destroyed, it is only our constructive imagination that builds up things as perceived, with all their relations and ourselves as perceivers. It is simply a convention to speak of things as known. Whatever we designate by speech is mere speech-construction and unreal. In speech, one could not speak of anything without relating things in some kind of causal relation, but none of these characters can be said to be true; the real truth can never be referred to by such speech-construction. When pressed further, these idealistic Buddhists would not agree to the truth or reality of mind as well, for the existence of the mind was only relative to its constructions, and apart from them the existence of even the mind could not be affirmed. Thus, in

spite of their idealism, the whole situation with reference to the origin of the phenomena was not more improved by them than what we find in Nāgārjuna. If the phenomena were all false and illusory, and if nothing beyond them could be experienced, we could neither explain the nature and cause of the phenomena, nor discover anything which could be called real or true. Buddhism by its dialectical logic resulted in absolute scepticism or nihilism.

It was at this juncture that first of all Gauḍapāda and later on Śaṅkara and his followers sought to discover a new solution by reverting to the Upaniṣads. If individual phenomena are all interdependent and false, then they cannot be true collectively; we ourselves are conversant only with the phenomena, and if in them we can nowhere be in touch with reality or truth, we must then be wholly unfamiliar with its nature and there is no means in our hands by which we could affirm that the accumulated whole could be called reality. The reason why the same dialectical criticism which rendered all the phenomenal manifestations futile could not be applied to the whole was due to a methodological difficulty, namely, that in assuming such a whole the logician is silenced by the very hypothesis that whatever inconsistencies may be pointed out are held within the whole and reconciled within it. If all finite and limited things are false and illusory and if there is no grain of truth in them, how can we discover the truth with them? To meet this difficulty Mr. Bradley assumed that all phenomena have a partial degree of truth so far as they are joined with the Absolute. But this truth would be no truth at all for it is only relative, and according to the fundamental principle of the dialectical logic it falls to the ground. If any truth is to be discovered on which we could stand as on a firm rock it must be found beyond or outside the relativity of the infinite series of interdependent phenomena. The Vedānta as interpreted by Śaṅkara and his followers did not try to find the reality in the whole as Rāmānuja did, but it maintained

that in every phenomenon we find an association of two different and distinct categories, the real and the relatively real or unreal. In all our concepts and ideas there is one element which is immediate and direct but not conceptually an object of knowledge. This immediate and direct element is nothing but the self-luminosity of knowledge as apart from the form and content that it revealed. This was what it called pure consciousness (*cit*), which existed independently by itself and did not depend for its manifestation on anything else. The logical outlook of the Vedānta differed from that of the Buddhists in this, that it maintained that there was a permanent self-subsistent and self-contained element in all phenomena and that these could not therefore be regarded as wholly relative, interdependent and false. In all cognitive states this self-subsistent entity is directly revealed as the illumination and revelation of consciousness. Apart from this immediateness, revelation and illumination, none of the characteristics of finitude or relativity could be associated with it. This self-subsistent entity is what is also called the self, and the Brahman by the Vedāntist. But by whatever name it may be called it is the only permanent and unchangeable reality, which underlies all phenomena, mental or physical. Though any phenomenon taken in itself cannot give us the truth, yet it is not wholly false for it has for its ground and basis the pure and self-subsistent spirit of Brahman. Whatever appears to us, be it an undeniable physical law, a thing upon my table, or the most grotesque illusion and fancy, has in it as its basis the spirit, the reality. So on the one hand, since nothing but spirit is real, there are no phenomena which are wholly true, and on the other, since they all have the Brahman as their basis, they are never wholly false. The phenomena of world-appearance thus present to us a curious union of reality and unreality. An experience according to Vedānta is said to be true if it is not contradicted by later experience; and it maintains that all other experiences

are contradicted some time or other, whereas the self-revealing Brahman is ever present with us and is never contradicted by any other later experience. There are no degrees of truth and reality in the sense in which Mr. Bradley uses the word ; but between one phenomenon and another there may be this difference that the falsity of one may be discovered much later than that of the other. Thus the illusion of a mirage is broken when one goes nearer to the place of illusion ; the illusion of a dream breaks only with the break of sleep ; but the illusion of world-appearance will not break until one has reached perfection. But it believes that if we lead the perfect life of a saint and cultivate the true philosophy of the Vedānta, a time will come when we shall realize that the Brahman alone is the reality and everything else is false.

The question naturally arises, what does Vedānta mean by regarding the phenomena as false ? Does it mean that they do not exist at all : that they are pure essenceless negation ? The answer that Vedānta gives to it is that we must distinguish between two categories, *viz.*, that which is absolutely real, unchangeable and self-subsistent and that which is changeable, dependent and only relatively real as appearance. The latter category is not absolutely negative, but it depends on the Brahman, the real, for getting itself manifested, and howsoever persistently it may appear as real throughout the course of our world-experiences, there comes a time in the life of a saint or a seer when it is found in its own nature as unreal ; since it persists throughout the course of our world-experience, it cannot be said to be negative or absolutely non-existing, but since it is not self-subsistent or self-contained and since the experience of the seer finds it to be illusory and false, it cannot be called real. It is the category of the unknowable and the indefinite and all creations of the manifold diversities of the world are due to it, and these appear temporarily as real on account of their association with the real, the Brahman. When the Nyāya realists challenged the

Vedāntists and tried to demonstrate that pure consciousness was as much a result of collocating agents as any other thing was, and when they maintained that all the categories of our ordinary experience had nothing indefinite or indescribable about them, the Vedānta dialecticians, Śrīharṣa and Citsukha replied to them by examining all their definitions, and showed that in whatever way we might try to define any of the categories of ordinary experience, such as time, space, causality, relation, quality, difference, etc., we came to contradictions, and concluded that it proved that their nature was relative and indefinable, and that they were thus nothing but the manifestations of the irrational and the unknowable. These categories are refuted in great detail, and it is impossible to give any adequate idea of it within the compass of this brief paper. I may, however, just give one example, the examination of the notion of difference, just to show the method of their discussions. Thus Śrīharṣa says that four explanations are possible of the notion of difference: (1) difference may be perceived as appearing in its own characteristics in our experience; (2) difference between two things is nothing but the absence of one in the other; (3) difference means divergence of characteristics; (4) difference may be a separate quality in itself. Taking the first alternative, we see that it is said that the jug and the cloth represent in themselves by their very form and existence their mutual divergence from each other. But if by perceiving the cloth we perceive only its difference from the jug as the characteristic of the cloth, then the jug also must have penetrated into the form of the cloth, otherwise how could we perceive in the cloth its characteristics as the difference from the jug? That is, if difference is a thing which can be directly perceived by the senses, then as difference would naturally mean difference from something else, such as jug, etc., that from which the difference is perceived must also be perceived directly in the perception of the cloth. But if the perception of difference between two things has penetrated together in the same iden-

tical perception, then the self-contradiction becomes apparent. Difference as an entity is not what we perceive in the cloth, for difference means difference from something else, and if that thing from which the difference is perceived is not perceived, then how can difference as an entity be perceived? If it is said that the cloth itself represents its difference from the jug, and that this is indicated by the jug, then we may ask what is the nature of the jug? If the difference from the cloth be the very nature of the jug, then the cloth itself is also involved in the nature of the jug. If it is said that the jug only indicates that it is a term from which difference is intended to be conveyed, then that also becomes impossible, for how can we imagine that there is a term which is independent of any association of its difference from other things, and is yet a term which establishes the notion of difference? If it is a term of difference, it cannot be independent of its relation to other things from which it is differentiated. If its difference from the cloth is a quality of the jug, then also the old difficulty comes in, for its difference from the cloth would involve the cloth also in itself; and if the cloth is involved in the nature of the jug as its quality, then by the same manner the jug would also be the character of the cloth, and hence not difference, but identity results. Moreover, if a cloth is perceived as a character of the jug, the two will appear to be hanging one over the other, but this is never so experienced by us. Moreover, it is difficult to ascertain if qualities have any relation with things; if they have not, then absence of relation being the same everywhere, everything might be the quality of everything. If there is a relation between these two, then that relation would require another relation to relate itself with that relation, and that would again require another relation, and that another, and so on. Again, it may be said that when the jug, etc., are seen without reference to other thing, they appear as jug, etc., but when they are viewed with reference to cloth, etc., they appear as difference. But this cannot be so, for the perception as jug

is entirely different from the perception of difference. It should also be noted that the notion of difference is also different from the notions of both the jug and the cloth. It is one thing to say that there are jug and cloth, and quite another thing to say that the jug is different from the cloth. Thus a jug cannot appear as difference, though it may be viewed with reference to cloth. The notion of a jug does not require the notions of other things for its manifestation. Moreover, when I say the jug is different from the cloth, I never mean that difference is an entity which is the same as the jug or the cloth ; what I mean is that the difference of the cloth from the jug has its limits in the jug, and not merely that the notion of cloth has a reference to jug. This shows that difference cannot be the characteristic nature of the thing perceived.

It is needless to give here the examination of the other alternatives of the criticism of the category of difference, for my intention is only to give an example of the manner in which the dialectical criticisms of Śrīharsa and Ītsukha against the realistic definitions of the categories of experience by Nyāya were directed.

Though not so definitely stated, yet when we look deeper we find that Nāgārjuna held that no worldly phenomena could be called either positive or negative ; he called them essenceless or indeterminate. This was with him a logical category which was neither positive nor negative, but indefinite. But Nāgārjuna did not acknowledge the existence of any other category. The Vedānta of Śaṅkara accepted the category of the positive and the negative, as well as that of the indefinite. All phenomena, so far as they were only relative and self-contradictory, were of the same nature as illusions, and could not be called either positive or negative. They are to be subsumed under a different logical category, viz., the category of the indefinite. The admission of this category indicates that the law of excluded middle is not fundamental. The logic of change and of illusion, of relativity and movement, seems to support the Vedānta view,

that side by side with positivity and negativity, the indefinite has a place in human thought, and that much confusion has occurred in philosophy by trying to solve all philosophical problems by a reference to the dual division of the positive and the negative. Philosophers who have not definitely admitted the existence of this category have often been forced to such difficult corners that, in spite of their great dialectical skill, they could hardly explain themselves without unconsciously accepting the indefinite as a possible logical category. The objection that is often made against this theory is that it is unintelligible and inexplicable. But the answer that Vedānta gives may best be put in the language of Mr. Bradley that "a theory may contain what is unintelligible, so long as it really contains it; and not to know how a thing can be is no disproof of our knowing that it both must be and is." The old Vedānta of the Upaniṣads was satisfied only in pointing out that there was a positive element in our consciousness which was the highest and the greatest truth; it did not concern itself to inquire into the logical status of the phenomena, of all that is outside the supreme reality. But the Buddhists challenged the existence of this permanent reality and maintained that all phenomena were but relative and there was no permanent reality in them. The later Vedānta proposed a compromise that all phenomena showed themselves to be a combination of two categories the positive—the permanent, and the indefinite—the changeable. But the question still arises as to how there can be any union or connexion between these two opposite categories? To this the Vedānta reply is that it is impossible to say how the connexion arises, but the fact remains that in all phenomena most of that which appears is only relative and dependent and does not represent the reality by itself, is not self-subsistent and self-contained, and is full of self-contradictions, and if we do not admit any further permanent and self-subsistent reality, we are landed in absolute scepticism and we have to ignore the

testimony of our consciousness in which we feel that we are somehow in touch with reality and the search of which is the ideal of all our scientific and philosophic inquiry. It may not be out of place here to point out that when Mr. Bradley after dealing with the self-contradictions of appearance turns to the problem of reality, he argues the existence of reality from the fact that in judging things we apply a criterion of reality. Thus he says, "To think is to judge, and to judge is to criticize, and to criticize is to use a criterion of reality . . . in rejecting the inconsistent as appearance, we are applying a positive knowledge of the ultimate nature of things. Ultimate reality is such that it does not contradict itself; here is an absolute criterion."* But a criterion cannot give us any information either about the nature of the reality or that it exists at all. It only remains as an instrument by which we can test whether any particular thing is false or not. But whether there is anything which can stand the test of the criterion, or what may be the nature of such a thing, the criterion is unable to solve. Mr. Bradley himself admits the justice of this criticism and says, "The criterion is a basis which serves as the foundation of denial; but since this basis cannot be exposed, we are but able to stand on it and unable to see it. And hence, in effect, it tells us nothing, though there are assertions which it does not allow us to venture on. This objection, when stated in such a form, may seem plausible, and there is a sense in which I am prepared to admit that it is valid."† But not only is the criterion unable to tell us the nature of the reality, but the Vedānta maintains that the reality which has to depend on a criterion in order to establish itself is dependent on it and therefore not self-valid; moreover if the reality is not immediate and self-revealing, the criterion cannot prove its existence. If there is any reality, it must be direct, immediate, self-contained

* *Appearance and Reality*, 136.

† *Ibid.*, 139.

and self-valid. Any reality which would require a criterion to establish it would according to Vedānta be only a relative truth, and so belong to the realm of the category of the indefinite. Vedānta, therefore, maintains that the definition of reality is that it is immediate, but not an object of any cognitive act (*avedyātve sati pratyakṣavyavahāra-yogyatvam*). Such an element can be experienced in all our conscious mental operation and the self-revealing nature of thought. This self-revealing pure consciousness is self-manifested and self-valid; it has no definite form or variety and is hence beyond the range of relativity. Whatever may be the variety of forms through which it is manifested, it itself is never changed and is never dependent on anything else for its manifestation. When the Vedānta says that the self or the Brahman is the highest truth, it does not mean by self what we ordinarily understand by it, *viz.*, the ego, the I, or the subject, for these are all relative and are hence the joint product of the reality and the category of the indefinite; the Vedāntic self is the pure self-revealing consciousness which manifests itself in all our mental states. The principle, however, is not only a subjective principle of thought, but it is the underlying reality of all phenomena. The definition or criterion of reality as want of self-contradiction is only an external one. When we seek to discover truth by this criterion in the field of the phenomena we can only discover relative truths, some of which will stand uncontradicted for a much longer time than others. But in the seer's experience they will all be contradicted, and the element of the category of the indefinite which forms their stuff will be made apparent to him, when he will discover that nothing but the Brahman is the truth.

Popular interpretations of the Vedānta based only on Śaṅkara without any reference to the works of his followers do an injustice to it when they explain it as holding that all phenomena are absolutely illusory, that they have no sort of being at all, and that the Brahman alone is real. This

statement is indeed literally true, but it is misleading, unless the logical status of the category of illusion is explained along with it. The problem before the Vedānta is not scientific, but logical and ontological. Science deals with the laws about the sequences of phenomena and not with their logical status. There may be atoms or electrons, mere sense-data or some other thing which scientists of a later age may be disposed to believe. It does not concern the Vedānta and it is indifferent to it. It maintains that whatever may be the stuff of the phenomena, it has logically the same status as illusion, it only presents phases of relativity and change, and if we look at it apart from its connexion with Brahman, there is nothing in it which can be described as the unchangeable reality. We cannot escape from the region of relativity and change, by simply taking all the phases together in one whole; it can only be done by admitting the category of the indefinite and the indefinable as a separate category of existence which appears to be invested with reality, by its association and seeming identity with the Brahman. What the Vedānta means by saying that the world-appearance is false, is that its appearance is relative, changing, and is such that it can be said to be both "is" and "is not"; it belongs to a wholly different logical category from the real. To admit the worldly phenomena as wholly relative would be to jump into absolute scepticism, and to accept them as wholly real would be to ignore the elements of change, relativity and illusion. The real and its contradictory cannot indeed be associated, but the world is not unreal, in the sense that it is contradictory to the real, it is so only in the sense that it is indefinite (*i.e.*, neither real nor unreal), and Vedānta holds that there can thus be an association between the indefinite and the real, by virtue of which the real appears as the phenomenal and the phenomenal as the real.

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W.C. 1, on March 20th, 1922, at 8 p.m.*

IX.—SOME BYWAYS OF THE THEORY OF KNOWLEDGE.

By R. F. ALFRED HOERNLÉ.

FOR the vagueness of my title I owe, perhaps, some apology to members of our Society. Frankly, I could think of no phrase, both concise and fitting, in which to sum up the topics which I wish to discuss. Hence it seemed best to select a title which, at least, gives fair warning that I shall avoid, as completely as I can, the technical problems of subject and object, of thoughts and things, of mental and non-mental, of the analysis of the "cognitive relation" and the nature of "cognitive acts," and many more like these, which meet us on the high road of current discussion. The problems to which I want to draw attention in this paper are either not examined at all, or else are disposed of with an *obiter dictum*. They touch the current distinction between "knowledge by acquaintance" and "knowledge by description" on the one hand, and, on the other, the part played by language in knowledge. I am constantly impressed—I might almost say "worried"—by the fact that a student of philosophy, perhaps more than any other kind of theorist, lives in a world of books. And though it is a consolation to reflect that the company of great books is a company of great minds, and that the same world of which these great minds render in these books their experience and interpretation, is open also to my experience, still the fact remains that I am introduced, in the first instance, to a world of words, a world of symbols, and that the meanings which I give to the words may diverge indefinitely from the meanings which the writers sought to express. Indeed, the relation is more complicated than this. For we must distinguish between understanding what the author means and

believing it, *i.e.*, accepting it as true. And these two things may fall apart. I may misunderstand the author and therefore fail to agree with him where I should have agreed, had I understood him correctly. And I may falsely agree with him because I misunderstand him to mean what I hold to be true, though it is not what he sought to express. But apart from these complications which could be pursued into much more detail, the broad fact is that to every student the vast bulk of his knowledge comes through books or, more generally, through words and other symbols which inform him in proportion as he is able to interpret them, *i.e.*, to fill them with meaning. In turn, the researcher or discoverer, be it a new observation that he wishes to record or a new principle that he wishes to propound, can only add it to the stock of knowledge by expressing it in words or other symbols that he himself (on a later occasion) and others can understand. Thus the situation demands to be looked at from two complementary points of view. We can (*a*) begin with the symbols and ask what is involved in understanding what they mean or express; and (*b*) we can begin with what is to be expressed and ask what is involved in translating this into a set of symbols. Somehow, these two processes must meet if self-communication and communication with others are to be possible, but in actual use these processes function imperfectly, and hence arise problems, some of which are to be briefly discussed in this paper.

Let us, to begin with, go back to the terms "knowledge by acquaintance" and "knowledge by description." On their technical analysis, as attempted, *e.g.*, by Mr. Russell,* we are not to enter, nor on an examination of the criticisms of Mr. Russell's position by Professor Stout† or by Dr. Bosanquet.‡ But if we are right in taking "knowledge by description" to refer, in fact, always to knowledge conveyed by words or other

* See *Proc. Arist. Soc.*, vol. xi (1910-11).

† See *Proc. Arist. Soc.*, vol. xv (1914-15).

‡ *The Meeting of Extremes in Contemporary Philosophy*, p. 145.

symbols and consisting in the apprehension of what these words or symbols mean, then it would seem that we must agree with Mr. Russell's thesis that "knowledge concerning what is known by description is ultimately reducible to knowledge concerning what is known by acquaintance," or that "every proposition which we can understand must be composed wholly of constituents with which we are acquainted."* I take this to mean that wherever knowledge is to be conveyed by words or other symbols, the meaning of these words or symbols must be understood, *i.e.*, it must be known in the way which Mr. Russell calls "acquaintance." Questions of technical analysis and technical terminology apart, is there on this point any real difference of opinion? When Dr. Bosanquet, *e.g.*, says: "We cannot suppose that a man blind from birth can ever make [or understand] judgments involving the *quality* of colours," or when he illustrates the way in which a man who has never seen the *Ægean* Sea solves the problem of understanding a description of it as a deep-blue sea under a cloudless sky, studded with rocky islands, by using recollections of sea and sky at Torbay and of the island-studded waters of the Hebrides,† he seems to express the same view. Words are meaningless, convey nothing, unless from present or past experience we can fill them with meaning.

But "experience" here is a vague term, and hardly improves on "acquaintance." Can we make somewhat clearer to ourselves what we mean by it? Perhaps, at this point, it may help if we go back to the passage in James's *Principles of Psychology*, through which most of us, probably, were first made acquainted with the distinction between "knowledge by acquaintance" and "knowledge-about" (as James called it). "*There are two kinds*

* See *loc. cit.*, p. 117. I am taking "description" in a somewhat wider sense than Mr. Russell who analyses it technically into phrases of the form "the so-and-so" or "a so-and-so." But for my argument this difference is, I think, negligible.

† *Logic*, 2nd edit., vol. i, pp. 40 and 69, 70.

of knowledge broadly and practically distinguishable; we may call them respectively *knowledge of acquaintance* and *knowledge-about*. I know the colour blue when I see it, and the flavour of a pear when I taste it; I know an inch when I move my finger through it; a second of time, when I feel it pass; an effort of attention when I make it; a difference between two things when I notice it; but *about* the inner nature of these facts, or what makes them what they are, I can say nothing at all. I cannot impart acquaintance with them to anyone who has not already made it himself. I cannot *describe* them, make a blind man guess what blue is like, define to a child a syllogism, or tell a philosopher in just what respect distance is just what it is, and differs from other forms of relation. At most, I can say to my friends, go to certain places and act in certain ways, and these objects will probably come. All the elementary natures of the world, its highest genera, the simple qualities of matter and mind, together with the kinds of relation that subsist between them, must either not be known at all, or known in this dumb way of acquaintance without *knowledge-about*. In minds able to speak at all there is, it is true, *some* knowledge about everything. Things can at least be classed, and the times of their appearance told. But, in general the less we analyse a thing, and the fewer of its relations we perceive, the less we know about it and the more our familiarity with it is of the acquaintance type. The two kinds of knowledge are, therefore, as the human mind practically exerts them, relative terms. That is, the same thought of a thing may be called knowledge-about it in comparison with a simpler thought, or acquaintance with it in comparison with a thought of it that is more articulate and explicit still.* Now, a careful reading of this passage reveals that James is really drawing the distinction between the two kinds of knowledge in two different ways: (a) he connects it with the presence or absence of language

* Vol. i, pp. 221-22.

when he contrasts the "dumb way" of acquaintance with all that knowledge-about enables us to "say," "tell," "describe"; (b) he connects it with the presence and absence of analysis, and makes it turn on whether or no we apprehend the "inner nature" and the "relations" of a thing. At the same time, he makes two further statements which are very striking, but not easily reconcilable with the first two, *viz.*: (c) he apparently holds of everything in the world that we must either know it by acquaintance or else not at all; and (d) that the difference between acquaintance and knowledge-about is relative. Without considering further whether James's account can be made consistent with itself, I shall take the points elicited from it and use them at once to define the position which I wish to advocate.

1. In the first place, I suggest that we cannot distinguish between acquaintance and knowledge-about either by the test of language or by the test of analysis. Consider, *e.g.*, a botanist who, having prepared a series of microscopic sections, is now engaged in studying them, and *pari passu* in drawing diagrams* of the structures revealed, and in formulating and writing down his theoretical conclusions. Granted that in his work he is using a great deal of previously acquired knowledge; granted, too, that when he first entered on his botanical studies, his acquaintance was "dumb" for lack of a technical vocabulary, and poor in discrimination of structures and relations for lack of training in observation illuminated by theory. But in so far as there is progress in knowledge in the course of such research, can we intelligibly say that it consists in an advance from acquaintance to knowledge-about? Does it not rather consist in a steady expansion of acquaintance towards greater fullness and completeness? If this is the correct view, we can appreciate

* It is an interesting question which has not, so far as I am aware, been considered on its merits, how the distinction between "acquaintance" and "description" applies to diagrams, sketches, photographs, maps, models, and other kinds of "reproductions."

that the investigator who observes and theorizes at first-hand has the advantage over those who merely read his account and have to construct as much as they can of his meaning out of the botanical knowledge which they possess already, aided by his diagrams and illustrations. If they wish to check and test his reports and conclusions, they must for themselves repeat his experiments and observations. They must personally traverse the path of his research: they must acquire the same intimate acquaintance with the facts. The authority of his first-hand observation and theory can be overthrown or confirmed only by other first-hand testimony.

2. In short, I am suggesting that current distinctions between "acquaintance" and "description" (or "knowledge-about"), or between "immediate experience" and "thought," should be supplemented by the distinction between knowledge which, for want of a better word, I must call *first-hand* and knowledge which is *second-hand* or *vicarious*. The main point is that first-hand knowledge, as I would use the term, is not restricted to "acquaintance" so far as that is merely dumb or unanalysed, or to "immediate" experience, if "immediate" once more means experience before it has been worked upon by discrimination, comparison, analysis, interpretation. On the contrary, there need be no limit to the amount of analysis and of expression through words and other symbols which "first-hand knowledge" may cover, provided always that our thinking is done, in Royce's phrase, "from the life," or, to put it differently, that we possess our meanings fulfilled, or realized, as abundantly as possible.

A series of illustrations may serve to make the point clear. "A man who has been in love may philosophize upon his passion, but no amount of intellectual sharpness could tell a man what it is to be in love who did not know."* "Know" here obviously means "know by acquaintance," know by being in

* Edwyn Bevan, *Hellenism and Christianity*, p. 35.

love. It would be irrelevant to object that it is possible to be in love without knowing that one is in love. For the point here is simply that one who had never even in the faintest degree been in love, could neither understand the language in which poets or philosophers have expressed that experience, nor could he have anything himself to express. If he were to use the term "love," he would quite literally not know what he was talking about. He would be as helpless and unintelligent in this field as the congenitally blind man is in the world of colours. But, on the other hand, acquaintance with what it is to be in love, or, as we should rather say, first-hand knowledge of it, still admits of many degrees and forms, and the limitation of one's own first-hand experience will inevitably affect the extent to which one can possess, in fulfilled form, the meaning of Plato's *Symposium*, or the whole range and depth of Dante's love for Beatrice. In any case, however, being in love, even though we call it an "immediate" experience, is certainly neither dumb nor unanalysed. It commonly includes manifold utterance and self-analysis. Even as a mere *Erlebniss*, it is yet a most complicated form of experience, opening up not merely new ranges of sensation and emotion, but of thought and action—in short, it is hardly to be contained within the limits of "acquaintance" or "immediate experience," as these terms are usually understood, yet it is genuine, and vivid, and first-hand throughout: an enjoyment of meanings fulfilled and fulfilments hoped for.

Now, the passage quoted just now concerning love is part of an argument to the effect that much current thinking about religion is poor thinking, not from lack of logical acumen, but from lack of data *with* which to think—from poverty and narrowness of religious experience. Religious experience, here, = being acquainted with religion = being religious. The argument, then, is that being religious is an indispensable presupposition for philosophizing on religion. This example suggests some curious points for reflection. First, shall we not philosophize better for exploring and practising at first-hand the various

forms of religious experience? The reading of James's *Varieties* is, surely, no adequate substitute for cultivating one's own religious life. If so, what of the detachment of many modern thinkers, not only from official church membership, but from the traditional vehicles of religious feeling, thought and action? If we do not pray, if we do not worship, if we do not participate in religious ceremonies with living faith, do we not thereby lose acquaintance with what it is to be religious, and are we not so much the more poorly qualified for thinking justly and truly on religion? It is certainly a curious phenomenon that philosophers, along with the educated classes generally, should everywhere be drifting away from religion at the very time when the ontological argument is being restated by way of developing "the meaning of God in human experience,"* and when theologians lay down, as the first canon for the study of Christ's teaching, the necessity of getting at the experiences behind the term "God."†

Another point for reflection raised by this example is that we may be acquainted with religion, as with all other forms of expressive behaviour, in two ways: (a) from the spectator's standpoint who studies, at first-hand, the behaviour which he observes, including the language which forms part of it; and (b) from the agent's point of view who knows, at first hand, what it feels like thus to behave and to use that sort of language. Now, though both these ways of knowing the phenomena are first-hand, is not the second incomparably more vital and complete? For a full acquaintance with religion we would, surely, need the worshipper's knowledge much more than the spectator's. The example of anthropologists may serve to emphasize this point. The European observer studies a native tribe, its customs, its beliefs, its ceremonies. He records, shall we say, a careful description of a religious dance as he sees it, takes snapshots and

* Cf., e.g., W. E. Hocking's book under this title. See also my *Studies in Contemporary Metaphysics*, ch. x.

† Cf. R. T. Glover, *The Jesus of History*.

perhaps motion-pictures of it, collects the musical instruments employed, takes a phonographic record of the music. The result is "science"—the best that science can do. To the scholars at home pictures and phonograph, so far as they go, make the facts accessible better than the most accurate verbal description (*e.g.*, how could the music be described?), but their knowledge will still be inferior to that of the original observer who saw the whole performance in its full setting of scene and circumstance. And his knowledge, in turn, is incomplete compared with that of the participants, whether as merely enjoying the expression of their feelings or as also believing in the significance of the dance, be it as magic, be it as an act of worship.

Another example to illustrate the value of the insider's first-hand knowledge: it is noticeable how constantly Dr. Bosanquet, in his various writings on Political Philosophy, appeals to "experience," generally qualified as "special" or "genuine," in support of the principles he lays down, and as an aid in their interpretation and application.* And if we are poorly qualified to theorize about matters social, economic and political, unless we are acquainted at first hand with the handling of men and affairs, so we shall also be poorly qualified to philosophize about art, if we have no genuine and trained power of æsthetic appreciation, or about science if we have not something of the mathematical, physical, biological habit of mind from personal work in these fields. Such a programme for a philosopher's education, it will be noticed, will end by being not unlike the

* Cf., *e.g.*, *The Philosophical Theory of the State*, 3rd edit., p. 181 *sq.*; or p. 184, on a pretty house as an element in the best life: "Who could doubt it who knows what home-life is?" He meets his critics very largely with the suggestion that either their experience is inadequate, or else that they fail to make full use of it in their theories. "Experience" here = whole attitude as citizen, the whole way of feeling, thinking, acting towards the community. This must be of the right sort, if it is to yield a sound theory.

advanced education which Plato proposed for his philosopher-kings between the ages of 20 and 35.

But, perhaps, there are limits to the value of the first-hand knowledge to be got by doing or suffering a thing? Something like this, at least, seems to be the point of that curious passage in the *Republic** in which Plato suggests that it will help a doctor if "besides acquiring scientific knowledge," he has himself "suffered from every malady" and is "not constitutionally very healthy," whereas a judge must not experiment with every kind of wickedness, but have "knowledge of it, but not personal experience" (ἐπιστήμη οὐκ ἐμπειρία οἰκεία κεχρημένον). With Plato's point about doctors we should hardly agree nowadays. Certainly, a sufferer from a disease knows that disease, by having it, in a way in which no doctor can possibly know it who has not had it too, but this sort of knowledge, for all that it is first-hand, is in general of little value either for science or for cure. In so far as our language is poorly equipped with terms for the accurate and systematic description especially of organic sensations, a doctor who knew a disease from the victim's point of view might be helped in understanding a patient's attempts at describing what he feels. But on the actual nature of the disease (the pathological processes in the tissue), and its ætiology, even the best record of sensations and feelings would, by itself, hardly throw any light. Thus, knowing by acquaintance what it feels like to have a certain disease might help a doctor to a more sympathetic understanding of the patient's state of mind, but would hardly make him a scientific physician. Turning to the judge, we find that Plato denies him a first-hand knowledge of vice and crime—the knowledge which is one with committing crimes and indulging in vice—on the ground that such knowledge would prevent the building up of the upright, "just" character, which a judge

* 408 D—409 B. The translation quoted is A. D. Lindsay's.

ought to have. In short, an indiscriminating appetite for first-hand experience in all directions is beset with moral dangers. There are ignoble curiosities. There are desires for knowledge which it is wisdom not to indulge. A colleague tells me that, in the course of W.E.A. lecturing, he came across a miner who prided himself on having, in his own person, made a comparative study of the experiences of getting drunk on various kinds of liquor. The analysis by this authority of the characteristics of champagne-intoxication versus sherry-intoxication is said to be particularly instructive and amusing. That many of the more elaborate and perverse forms of sexual vice are due to a desire to increase both variety and intensity of an almost agonizingly pleasurable experience will be acknowledged. Thus our seeking for knowledge at first-hand is subject to the distinction between legitimate and illegitimate curiosities, though the line between them may be drawn differently by different people. At any rate, Plato's argument about the doctor and the judge suggests that the emphasis on the value of first-hand experience, as the agent, not the observer, has it, must not be overdone. There are kinds of first-hand experiences which it is, on moral grounds, best to be without. And the doctor's, which is an observer's, experience is both more complete and practically more useful than the patient's. We can hardly deny that diagnostic skill, acquired by long practice and reinforced by instruments, like the stethoscope, and by the study of the pathological processes in the body, gives a knowledge of diseases, by first-hand observation, which is much more exhaustive and relevant than the knowledge of first-hand suffering.

But there is one field in which the best knowledge of an observer will not match the knowledge of a performer. This is the field of skilled bodily movements. Anyone will appreciate this who has tried to learn, or even merely to understand, a game from a book. However minute and careful the description, acquaintance with it in the form of watching the game

played, or the stroke performed, will be conceded to carry the knowledge acquired from the description a good deal further. And yet a further stage is reached when acquaintance takes the form of playing the game, or performing the strokes oneself and improving by practice and with "learning by experience." Professor Pear is quite right when he points out* that "bodily skill, or the ability to deal with the world by means of one's muscles, joints, and tendons, carries with it a specific and unique kinæsthetic knowledge," a knowledge which in its own wordless character may yet form a basis for conceptual thinking, and which is "as incapable of perfect translation into the terms of another sense as is music into colours or words." How largely skilful performance depends on knowing by past experience what the intended movement feels like, and being able to reinstate the feeling when required, Professor Pear points out; as also how little verbal descriptions can help for lack of a vocabulary with which to express the differences with which we are acquainted in this kinæsthetic field.†

II.

In the first section of this paper the attempt has been made to introduce, alongside of the concepts of "knowledge by acquaintance" or "immediate experience," the supplementary concept of *first-hand* knowledge which shall include mediate and descriptive elements and thus transcend immediacy or acquaintance, considered simply as dumb or unanalysed, whilst at the same time it shall resemble immediacy in the fulfilment

* "The Intellectual Respectability of Muscular Skill," *British Journal of Psychology*, vol. xii, part 2, Oct. 1921.

† In a very different region of skill, the same general principle obviously applies. We can learn to play chess from Capablanca's *Chess Fundamentals*, but the fullest study of the principles of the game, even as illustrated by diagrams and analyses, does not, as Capablanca rightly insists, give the knowledge which comes only with practice, i.e., with first-hand experience of the use of the principles in endlessly varying situations.

or realization which its meanings possess. From this attempt, whether successful or not, I propose to turn now to a very different, though allied, topic. If it be granted that genuine philosophizing is, in its own realm, such a process of first-hand knowledge-getting as I have sought to describe, in what language, or terminology, should its results or findings be expressed? In other words, I wish to direct attention to the puzzling fact that, in stating their findings even concerning the same subject-matter, philosophers use a variety of alternative vocabularies, which are mutually more or less incompatible, and which occasion the proverbial disagreements and divisions into "schools." I want to raise the question, whether there is any way of determining which of these languages is the best—which fits, or expresses, the facts most accurately.

Concerning the existence of a variety of philosophical languages, there can be no doubt. But the choice of a terminology is a momentous matter, and terminological disputes are not mere squabbles about words. When Hylas argues that it is purely a question of a "name" whether the "Power" which "affects us with ideas" is to be called Matter or Spirit, Philonous rightly replies that it makes all the difference, for Matter is inactive and extended, Spirit is active and unextended.* Similarly, it makes all the difference whether we talk of colours, smells, temperatures, etc., as sense-data or *sensa*, and therefore as physical or, at any rate, non-mental, or whether we talk of them as sensations or "ideas of sense," and therefore as mental. Are physical things to be described as "collections of ideas" (Berkeley) or "classes of sense-data" (one of Mr. Russell's later dialects), as non-perceptible somewhats which cause sense-data to be presented to our minds (one of Mr. Russell's earlier dialects), or as "products of the synthetic activity of thought working on the manifold of sense" (Kant)? Is the mind to be spoken of in terms of "acts enjoyed" as distinct from "objects

* Berkeley, *Third Dialogue between Hylas and Philonous*, in *Fraser, Works*, vol. i, pp. 456, 7.

contemplated" (Alexander), or in terms of an "experient" or "self" who perceives, thinks, feels, etc. (James Ward), or in terms of the "stream of consciousness" with its constituent "processes" or "events" (William James)? Or are we, with the extremest behaviourists, like John Watson, to drop the language of consciousness altogether, just as chemistry has dropped the language of alchemy and astronomy that of astrology? Bergson insinuates his whole philosophy by the choice of his language in the opening pages of *Creative Evolution*. "What do we find?" he asks. No question could seem more innocent. "I find that I pass from state to state," and, presently, "we find that, for a conscious being, to exist is to change, to change is to mature, to mature is to go on creating oneself endlessly." Agree to this language, and you have committed yourself to Bergson's philosophy. You are ready then to extend this language to the universe: "The whole progresses, it may be, in the manner of consciousness. . . . Organic evolution resembles the evolution of consciousness." But why should we adopt, in the first instance, this rather than any other terminology for expressing "what we find"? Again, Professor Whitehead has recently given us a whole new terminology for, *i.e.*, a fresh analysis and description of, precisely that field which has been surveyed with a greater variety of technical dialects than any other, *viz.*, the field of "nature" or "what is perceived by the senses." Even in the most abstract topics of philosophy we do not escape this multiplicity of languages. Witness the interesting symposium of this Society on the language to be used in talking of "cognitive acts," and in the course of this symposium Professor Broad's opportune reminder of the alternative ways (*i.e.*, alternative languages) in which the "cognitive relation" has been analysed by different thinkers.* But enough of examples, which could be piled up indefinitely. Obviously, the choice of language is crucial. For

* *Proc. Arist. Soc.*, vol. xxi (1920-21); on "Cognitive Relation," see esp. p. 142.

the question, What language are we to use? is the same as the question, What meanings are we to affirm? And this again is one with the questions, "What are we to think of the object? *What, in fact, is it?* What are its nature and relations? Thus the choice of a terminology, because it is a choice of meanings, settles what we shall claim to "know," what will be for us "reality" and "truth."

Now, definition does not help in this predicament at all. The framing of definitions is very valuable for the elaboration and the self-consistent use of a technical language, but the *applicability* of the language is not thereby determined. At least it is curious to observe how often precisely those thinkers who take most trouble to define "what they mean," end their defining labours by asking gloomily: Is there such a thing? In other words, Does the definition apply to anything? Can the meaning defined be predicated of anything that actually exists or occurs? Can it be referred to reality? Well may we sigh for ontological arguments to help us attach once more our supposititious meanings to actual reality!

On the other hand, does it help to go back to the "facts" or the "data," to the "experience behind the words"? Hardly—for "raw, un verbalized experience," as James called it, seems—to judge by the variety of philosophical dialects which flourish side by side—to suffer all dialects with equal patience and indifference. The individual thinker will, no doubt, make his choice, guided by some obscure sense of fitness or by some preference, the motives for which may lie hidden in his subconsciousness, and he will reject the language of his opponents because somehow it does not render for him the total impression which he has gathered cumulatively from all his first-hand use of his own experience. But whilst he can proclaim his disagreement, and give to himself in his own language good reasons for preferring that language to his opponent's, as

* For examples of this predicament, see the Symposium on "Cognitive Acts," *passim*.

expressing more truly the nature of things as he sees them, he cannot demonstratively compel his opponent to acknowledge that his vision and his language are better.

Of course, a philosophical language, like every other language, has to be learnt by practice—practice in the use of it, in thinking in its terms. To what extent our disagreements and misunderstandings are due to not practising one another's language sufficiently, is a question well worth asking. How, *e.g.*, ought one to express, in one of the several dialects of realism, Mr. Bradley's theory of the divorce of "idea" from "existence"? And, if it cannot be realistically expressed, what conclusion follows for the truth of Mr. Bradley's theory, on the one side, and the truth of the particular realism in question, on the other? At any rate, such experiments in expressing the same point in the languages of rival philosophies might help towards a more reasonable choice. Further, the familiarity which comes with practice will do much to remove the unintelligibility and unconvincingness which belong at first to a strange philosophical language. The practice of different languages and, through them, of different points of view, might be made a much more definite feature of the training which students of philosophy at our Universities receive. And, in general, it would be a valuable contribution to philosophical technique if the main philosophical languages were systematically formulated. The result, I suppose, would be not unlike alternative sets of definitions, axioms, and postulates, such as those with which Spinoza prefaces the successive books of his *Ethica*. The gain in clearness would, I believe, amply repay the labour,* and might even reveal grounds for a rational preference.

* The only attempt in this direction—and this a fragmentary and not very successful attempt—with which I am familiar is hidden under the title "Relativitätstheorie und euklidische Geometrie," in an article by Dr. Christoph Schwantke, in the *Annalen der Naturphilosophie*, vol. xiv, 1, pp. 35–48. I owe the reference to Dr. H. M. Sheffer, of Harvard University.

*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1,
on May 1st, 1922, at 8 P.M.*

X.—REALISM AND VALUES.

By MARGARET MCFARLANE.

I.

IN his essay on "Realism, a Study in Art and Thought," Mr. A. McDowell draws attention to the fact that alike in Philosophy and Art there has in recent years been a tendency to dwell upon "values" rather than "ideals." The change is not one of terminology, merely, but expresses a change of attitude. Ideals are constructions of the intellect embodying in abstract form what ought to be; values express an actual relationship to the purposes of the concrete living subject. "You may conceive an ideal perfection and regard it coldly; but it becomes a value if it embodies what you really feel" (p. 251).

The study of values is one of the "growing-points" of philosophy at the present time, and a glance at the literature of the subject is sufficient to show that there is as yet little agreement as to analysis or interpretation of the facts which come under consideration. Differences in treatment depend partly on the general philosophical standpoint of the writer and partly on the complexity of the value situation itself.

What, then, are the factors to be distinguished whenever we find "values"? In the first place, there are the elements which are present in any cognitive process, viz., a knowing mind and an object known. Over and above these are the features peculiar to the value complex,—the subject is not merely a knower, but is also an agent; the object is not merely a thing known, but is also a thing which satisfies a want, or fulfils a purpose of the knower. Accompanying these relations of the subject to the object is the peculiar feeling tone which characterizes the worth situation.

In the simplest kind of values, mere "likings" and "dislikings" these elements are clear; *e.g.*, "I like peaches" implies a knowledge of the fruit through sense perception. It means also that peaches satisfy a want which I feel from time to time, and in so doing, have value for me. The statement "Peaches are delicious" characterizes the same set of facts in a slightly more permanent way.

It implies, as above, that I know the fruit, that it satisfies my desire, and in addition that for me, at least, it always has this value. In other words, by attributing universality to the conditions which are found to give satisfaction, those conditions tend to be regarded as a quality of the object itself. "Deliciousness" comes to be thought of as a property of peaches. No one making this statement, however, would seriously challenge an opponent who disagreed with him; the fact of disagreement would merely serve to bring home the subjectivity of the judgment to both concerned—"Chacun à son goût." But quite a different attitude would be taken to the man who challenged the beauty of the Demeter, or the truth of a well-established scientific doctrine, for in such cases we claim that the value holds for all minds and at all times. What is the ground of such universality? The answer to this question will depend upon the philosophical standpoint of the thinker

It is, I think, a question of particular interest to thinkers of the realist school. For realists the cognitive relation is an external one and reality is independent of mind. Values, however, are stubbornly subjective, and yet they are no less real. How then does realism deal with values? As a matter of fact, there is great divergence among realists themselves, and in what follows I wish to discuss the accounts given by Dr. G. E. Moore, Professor R. B. Perry, and Professor Alexander as typical of attempts which this school of thought is making to deal with the problem.

II.

Perhaps the most thorough-going attempt to treat values objectively is that of Dr. Moore. He boldly maintains that values belong to objects quite apart from mind, and are unaffected by minds or wills. Ideas of goodness, truth and beauty are indefinable. "If I am asked 'What is good?' my answer is that good is good and that is the end of the matter. Or if I am asked 'How is good to be defined?' my answer is that it cannot be defined" (*Principia Ethica*, p. 6). Again, "If we set ourselves seriously to find out what things are good, we shall see reason to think . . . that they have no other property both common and peculiar to them besides this goodness—that in fact there is no criterion of goodness" (pp. 137–138). Further, this unique quality belongs to objects or situations as such and is not dependent upon judgments of minds. When arguing against Sidgwick's restriction of the ultimate practical end for man to Goodness, Perfection or Excellence of human existence, *i.e.*, to characters, of human existence, Dr. Moore puts an extreme case as illustrating his point. He bids us imagine a world exceedingly beautiful, lovely in form and colour and harmony. Then imagine the ugliest world possible, let it be a heap of filth containing everything that is to us most disgusting for whatever reason. He bids us then compare these two worlds. "Supposing them quite apart from any possible contemplation by human beings; still is it irrational to hold that it is better that the beautiful world should exist than the one which is ugly?" (p. 84). His answer is that the only rational view is that the beautiful world is in itself better than the ugly one, "then it follows that however many beings may enjoy it, and however much better their enjoyment may be than it is itself, yet its mere existence adds something to the goodness of the whole: it is not only a means to our end, but is also itself a part thereof" (p. 85). Value being intrinsic in certain objects is as inde-

pendent of knowing minds as are secondary qualities; and is not in any way to be regarded as correlative to a desiring subject. It is not the same thing as to say that any being or set of beings has towards it any mental attitude whatever—either an attitude of feeling, or of desiring or of thinking something about it. And again, "By saying that a thing is intrinsically good, it means that it would be a good thing that the thing in question should exist even if it existed quite alone without any further accompaniments or effects whatever" (*Ethics*, p. 65). In his earlier writings Mr. B. Russell takes a similar view. He also points out that it is no more possible to analyse "goodness" and "badness" than to analyse "redness." The nearest we can come to an explanation of it is to say that a "thing is good when on its own account it ought to exist and bad when on its own account it ought not to exist" (*Philosophical Essays*, p. 5). Again, "Good and bad are qualities which belong to objects independently of our opinion just as much as round and square do; and when two people differ as to whether a thing is good only one of them can be right though it may be very hard to know which is right" (p. 11). Because the idea of good is thus simple and ultimate, it is illegitimate to draw any conclusions involving it from premises in which it is not expressly stated. An illegitimate inference of this kind is made when it is held that the doctrine of evolution is a ground for belief in the goodness of things. "Goodness" is an ultimate concept and is not in any way deducible from evolution.

In Mr. Russell's later writings there are indications of a change of attitude toward this question. In the Introduction to *Mysticism and Logic* there occurs the significant statement. "I feel less convinced than I did of the objectivity of good and evil" (p. 8), and most of the essays in that volume urge devotion to a purely scientific standpoint as the right attitude of philosophy, ethical ideals being valuable only as "the indication of some new way of feeling towards life and the

world, some ways of feeling by which our own existence can acquire more of the characteristics which we most deeply desire" (p. 109). In other words, Mr. Russell has given up the doctrine of the Independence of Values.

The views of Dr. Moore and Mr. Russell represent one extreme in the attempts of realism to deal with values. If this view were tenable it would have the great advantage of avoiding confusion between the subject, and the valued object, —the value would lie wholly in the latter. Again, the distinction between the act of judging a value, and the value itself would be clear; the act would be like any other act of judging, and the value would belong entirely to the object. The difficulty of this view, to me, lies in the very conception of a value which is wholly independent of a subject who values. To say that it is better that the beautiful world should exist rather than the chaos of ugliness which Dr. Moore pictures does surely reintroduce the idea of a mind "for whom" it is better.

As an example of a totally different method of treating the problem in accordance with principles of realism, a method which leads to the opposite extreme, I turn to an article by Professor R. B. Perry, entitled "A Realistic Theory of Independence." This paper is Professor Perry's contribution to the volume entitled *The New Realism*. Here he maintains that it is not the part of realism as such to reject off-hand, subjective existence, but rather to be more critical of it, and above all to avoid hypostatizing subjective facts into substantive existence. In this paper he devotes a section to the realm of subjectivity (pp. 136-144). He finds that all cases which come within this realm are complexes, including among other factors, consciousness. No such complex is subjective through and through but may be analysed into elements or lesser complexes which are objective. Among such complexes are values. Values are essentially a function of desire and have reality only in the fulfilment of interests.

"There is no quality or combination of qualities that is inherently valuable; or incapable of possessing value; or exclusively valuable in the sense that things would be valueless without it. Such interest as that of desultory curiosity or promiscuous acquisitiveness may invest *anything* with value; and there is nothing so precious that its value would not disappear if all needs and likings and aspirations were extinguished."* The value of an object then depends upon a desiring subject, but it is not necessary that the subject should know that he is desiring to constitute the object valuable. In fact, he urges, if interest did *cognize* value the value would be not the fulfilment of desire, but a quality of the object as Mr. Moore regards it. This he considers untenable. "In so far as I find traces of what some regard as irreducible feeling qualities, they localize themselves in my body or not at all; in proportion as I distinguish and examine them they lose all semblance of that presence in the object which becomes increasingly clear and unmistakable in the case of colour and sound. In short the attentive effort at localization, whereas it unites the secondary qualities with the object, dissociates the alleged tertiary qualities and tends to unite them with the sentient."†

The attitude of interest then does not cognize the value upon which it is directed but it *constitutes* the value.

It is important therefore for clearness in discussion to distinguish between a *fact* of value and a *judgment* of value. This distinction is brought out most clearly by Professor Perry in the following example. In the statement "I like the Monna Lisa because it was painted by Leonardo," there are included two separate judgments:—(1) "I like the Monna Lisa" which is a judgment of value. It reflects, he says, a more immediate experience of the fact than does *your* statement that I like the

* R. B. Perry, *Present Philosophical Tendencies*, p. 333.

† R. B. Perry, "The Definition of Value," *Journal of Philosophy*, vol. xi, p. 153.

Monna Lisa, but it is in no other sense different from it. And (2) "Leonardo painted the picture" which is evidently not a judgment of value, but in this case happens to be the condition of the existence of a value. In addition to these two judgments there is the complex state of mind which contains his liking of the picture. "This is the central fact but it is no more *judgment* than is my entering the Louvre to see the picture. It *constitutes* value, but does not judge it; it determines the truth or falsity of the judgment that I like it, but is not itself true or false" (p. 161).

What then is the real nature of this "liking" which is the central fact of a value experience? It would seem that it is ultimately nothing but an attitude of the subject expressed through bodily changes in response to an object. "They (tertiary qualities) appear to me to be either modes of attitude or impulses and thus motor or sensory *qualia* which are localizable in the body. . . . I conclude that interest is not an immediate cognition of value qualities in its object but is a mode of the organism enacted, sensed and possibly felt, and qualifies the object through being a response to it" (p. 153). Such being the nature of value the cognition of value lies in the observation and recording of different interests and determining their relations to one another and to their objects. The judgment of value is a judgment about interest but is otherwise like any other judgment.

Professor Perry allows that it is repugnant to our ideas to admit that the bare psychological fact of a particular liking is in itself a guarantee of value. Human thought demands a criterion by which superiority and inferiority shall be assigned to the values themselves. Perry himself finds such a criterion in the idea of a quantitative scale of interest fulfilment. That which serves to the fulfilment of more interests, or to their more permanent satisfaction is better than that which results in a less fulfilment.

"It is certainly more plausible to argue that value is

restricted to the satisfaction of one's whole self, whether objectified or not, but in any case distinguishable from the momentary impulse. Good would then be that which satisfies a person *thoroughly* or *fundamentally* or *permanently* after every interest has had an opportunity through reflection of making its claims count. But if one asks why this sort of interest fulfilment deserves precedence of the fulfilment of isolated or momentary impulses, for my part I can find only one answer. It is because it is a more conserving, fruitful fulfilment of an aggregate of interests than is possible when these interests are unorganized. The organized fulfilment of a self is better than the disorderly indulgence of its several impulses on the ground that the fulfilment of interest as such is good, and *therefore the more the better*" (p. 157). And again: "There is no specific kind of interest, personal, social, or metaphysical, that can be said to determine value exclusively, or even preeminently, save in so far as it sums or enhances the fulfilment of unlimited interest" (p. 159).

Even those interests which expressly contain a ground beyond themselves are amenable to the same criterion. I admire the floral decoration of a certain dinner table assuming the roses to have come from the greenhouse. I may desire medicine on the ground that it will cure my cold. In such cases the ground of the liking or desiring is open to verification. If the roses turn out to be made of silk I shall cease to admire them (as table decoration at least), and their value ceases. If the medicine does cure my cold, its value is felt to be well-grounded and becomes greater; for, as Perry points out, in getting the medicine I should have got two things I desired, the medicine and the cure. "A valuation that is undisturbed and fortified by increased light is in a special sense a true valuation or a genuine value. . . . A value founded on truth is hardier and more prolific—and there is the truth value in itself to be added" (p. 160).

III.

In his account of values* Professor Alexander has much in common with Professor Perry, and would, I imagine, to a large extent agree with him. Alexander's treatment is particularly valuable, as we have here the subject brought into close relation to the rest of a realist system, exhibited in fact as the crowning point of a metaphysical structure built upon a realist foundation.

Throughout his system Professor Alexander works with the idea of evolution, and he finds the hint of what at a later stage becomes value proper, in the principle of adaptation to environment. Natural Selection, so far from ignoring values, as is sometimes urged, is but a name for the way in which values are established. The process may be detected as low in the scale of evolution as the chemical elements; in the organic world it is clear. That a particular type of plant or animal flourishes in given surroundings while other types die out means that such an environment *is good for* such a type, and, *vice versa*, the type *is good for* the environment. Among the higher animals, where the creature actively seeks or rejects objects in fulfilment of its instincts, value shows itself still more clearly; the object satisfies an interest in the subject.

But value in the fullest meaning of the term is only to be found at the stage where reflective consciousness has developed. Throughout the development of his argument in *Space, Time, and Deity* up to this point, Professor Alexander has exhibited reality as a system of complexes of space-time, some of which we call things and others minds. Minds share the characteristics of things and possess the further property of being conscious; but the cognitive relation in no way affects the thing apprehended. In the realm of values, however, the relation between minds and the rest of reality is very different; here mind may be said to be creative. "Values are unlike the

* Alexander, S., *Space, Time and Deity*, vol. ii, p. 236 ff.

empirical qualities of things, shape or fragrance or life; they imply the amalgamation of the object with the human appreciation of it. . . . We have values or tertiary qualities in respect of the whole situation consisting of knower and known in their compresence. Strictly speaking it is this totality of knower and known, of subject and object which is true or good or beautiful" (p. 238). For Alexander as for Perry it would seem that value arises then in a particularly intimate connexion between minds and objects. Certain things seem beautiful, others ugly; certain acts good and others bad; certain judgments true and others false; because of a tendency of mind to seek satisfaction in certain directions. The satisfaction of the tendency to learn, the desire to do, and the desire to express ourselves in outward form gives rise to the tertiary qualities. It will be found that what satisfies the tendency in each case is coherence within the object sought. We must beware of inventing a quality of satisfactoriness which may be predicated of the object; or of imagining that coherence itself is a quality of the object. The situation brought about by the union of minds with things in the realm of values is literally the creation of a new level of reality; and the attribution of the term valuable either to the subject or object presupposes this higher complex (p. 302).

Truth is reality as possessed by minds—the assertion that such and such belongs to space-time. It is therefore embodied in a judgment. The act of judging or believing stands over against its object which is an assertion or a proposition. "A's going down the street" is a relation which I perceive; "A is going down the street" is the same relation judged. "The judgment is the percept dissected and reconstructed; it is not merely a perspective of reality but a perspective containing an assertion; I shall say an asserted perspective" (p. 250). That which is thus judged is a "fact." Now concerning facts we may not ask whether they are true or false—they are neither for they are real. But we may legitimately ask whether they

are truly facts as they claim to be. The old question "What is truth"? may bear one of two meanings. It may mean "What propositions must I believe in order to have truth"? In this case the answer is supplied by the sciences. Or it may mean "What makes truth true"? Alexander's answer to this is as follows: "Any reality is an occupation of space-time in a particular configuration. I call that its internal structure. . . . Truth and error depend in any subject matter on whether the reality about which the proposition is conversant admits or excludes that proposition in virtue of the internal structure of the reality in question; this truth is apprehended through intercourse of minds of which some confirm the true proposition and reject the false and the truth is the proposition so tested as thus related to collective judging" (p. 252).

The test of truth then is not correspondence to reality but the coherence amongst themselves of propositions. True propositions belong to reality; false ones introduce elements from elsewhere; they are found to be incoherent with true ones and are rejected by us. True propositions, however, are real facts and except for their truth (*i.e.*, being possessed by mind) they are the same as reality itself. The only reality error possesses is as the object of the judgment.

Whereas coherence among true propositions and among the minds which believe them is determined by the nature of reality itself, in the realm of practice it is coherence among wills which primarily determines what is *good*. "The reality which we produce is good in so far as it satisfies coherently the persons who bring it about" (p. 274). The objects of will are propositions or connexions of fact which we seek to bring about in the external world, *e.g.*, a certain journey is to be taken. In order to bring about what I have thus first in idea, it is essential to be guided in my action by the nature of the particular bit of external reality in which I find myself, including existing social institutions. I must for example fit my actions in with the local railway time table. But the primary fact is that a

conscious mind wills an object and the realization of that willing involves changing the external world. Human beings are essentially social in character. Hence in some cases, they co-operate with one another to bring about the objects of their willings; in other cases they compete with one another for the realization of incompatible ends. Out of this ceaseless conflict there emerges a body of "goods" approved by the general body of agents. These are conserved in various moral and social institutions and become the standard by which either an agent or his action is judged. "The characters are good which act in the spirit of these institutions, and the various types of their goodness are the virtues of character. The non-mental facts which are the purely external aspect of the institutions are not good in themselves but only as securing in certain fashion, that is, coherently, the satisfactions of the passions of the persons engaged" (pp. 277-8). Since moral institutions and laws are concerned to secure the coherent distribution of satisfaction among individuals, evil is the failure to do this. Evil deals with the same conditions as good, viz., human nature and the external world, but handles them amiss; satisfaction is not achieved, or is achieved by the wrong person, or in respect of the wrong objects. Evil is therefore the moral counterpart of error.

In the case of the third type of tertiary quality,—beauty and its unvalue ugliness,—the connexion between minds and things is still more intimate. When an object is judged to be beautiful a part of the object itself is supplied by the mind. As compared with a perceived thing, the beautiful object is illusory, for it does not exist in the form in which it is apprehended. But as compared with an illusion the beautiful object is not erroneous because it is not attributed to any real object outside the æsthetic experience itself; it is a new sort of reality brought into being by the mind itself in combination with objects.

If the æsthetic semblance were taken to be real it would become cognitive illusion and cease to be æsthetic; for example,

the figures in Botticelli's "Spring" express movement, but if we thought they really moved, the æsthetic effect would at once disappear. Beauty in an object means the harmonious blending of elements, some existing in reality and some supplied by the mind itself. But it means more also. It distinguishes those minds which do see beauty in the object from others which fail to do so. "Coherence in the internal constitution of beauty is also coherence among the minds which appreciate it, and exclusion of other minds" (p. 294). Such persons who do appreciate beauty become standard minds—this is only possible because the beautiful percept is the result of a judgment. "Just because such judgments, 'I see this alive,' 'I see this form solid,' are implied in the beautiful work, it is possible for others to take note of my attitude and at once to find the same object beautiful and to share my attitude; to approve both the beauty, and me in my pronouncement that it is beautiful" (p. 295). The propositions we deal with in judging beauty are different from the propositions of truth and goodness. They are neither ordinary external propositions, nor are they mental propositions, but they are propositions in which mind and the non-mental are combined. This account of the appreciation of beauty applies not only to works of art but equally to natural objects. In the case of a natural object Professor Alexander maintains, when its beauty is felt it is incorrectly perceived—something is added to or selected from reality in the process.

This view seems to me to be full of difficulty. I admit that we *may* read our moods into a scene (p. 289)—the whistling wind over dried stems of dead grasses on the hillside may sadden us; but when we describe the scene as "dreary," "lonely," we do so knowing well that the "dreariness" is a mode of ourself not a quality of the landscape. In other cases where we admire the beauty of a landscape or the grandeur of mountain scenery, I fail to see that mind does add features to the object in the way Professor Alexander suggests. In admiring a landscape it would seem that it is the form of the

various objects, the wealth and blending of colours, which call out immediately the response of human appreciation. These features would undoubtedly not be the same if I stood on the hill itself but the modified features are "mere appearance" in Professor Alexander's sense of the term, and are due to external reality, not to mind. The blueness of the mountains and their rugged outline, the blending of the purple and gold of the heather and gorse, which are the elements I consider beautiful are undoubtedly due to the distance from which I am viewing them, but I cannot see that in judging them as beautiful mind has added anything more to them than in judging them as distant. When the mountain is judged as distant the proposition claims to be true; and if the claim is coherent with all other true propositions about the mountain then reality is of this character,—and the mountain is distant. When the mountain is judged to be beautiful, then its beauty according to Alexander lies in the fact that the proposition judged presupposes another proposition in which the mind has in some way united itself with the mountain. In each case the "judging" must be a bare act of assertion. These assertions are distinguishable the one from the other only by their objects which are in the first example an assertion about external reality as such, and in the second an assertion about external reality combined with mind.

One cannot help feeling that this treatment of values gives no account of the experiencing of value. How does the enjoyment of a judgment of truth differ from the enjoyment of a judgment of beauty? Yet as experiences they are certainly different. Would Professor Alexander agree with Professor Perry in describing the "central fact" of value experience as "modes of attitude and impulses," or "as an enacted, sensed, or possibly felt mode of the organism," or is there no such "central fact"?

Professor Alexander's account of truth I find still more difficult. It is asserted that the criterion of truth is coherence among propositions, *i.e.*, assertions about reality; but if truth

thus follows reality and is determined by it what is gained by denying coherence to reality itself? (see p. 258). Unless reality itself be coherent how can "truth about reality" be so? It would seem that by thus refusing to admit that it is the nature of reality to be coherent, Alexander is driven, in spite of himself, to treat truth as a subjective character of minds, for he is compelled to admit that a fact which is true to-day may be false to-morrow (p. 263) or even that contradictory facts may be true for two minds at the same time if they live under different conditions. "The once true proposition may turn out even to be erroneous for the newer knowledge, while it remains true and real as such within the narrower range of ancient revealed fact." Professor Alexander's criticism of the pragmatic view of truth is that it gives no account of the nature of reality but states simply "Truth is that which works." He himself would go a step further and say, "Truth works because it is determined by the nature of reality"; but for a satisfactory theory of truth one must I think understand "determined by reality" in a more drastic sense than Alexander himself does.

From the point of view of his theory there can be no distinction between a "judgment of fact" and a "judgment of value," for every judgment must be of the latter type. One feels, however, that there is a real difference in status between truth and the other tertiary qualities. While goodness and beauty are predominantly *subjective* in reference, even when universal in form, truth is essentially *objective*. Goodness and beauty are determined primarily by the efforts and interests of individual subjects; truth is determined primarily by the nature of reality itself. Acts of believing or judging are of course subjective and transient in character; but truth possesses a form of reality timeless and unchangeable in and through which the world of changing existence is revealed to us.



*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1,
on June 12th, 1922, at 8 p.m.*

XI.—GEOMETRY AND REALITY.

By THOMAS GREENWOOD.

FOR many centuries, geometry and mechanics had the most brilliant fortune as rational sciences. But the discovery of non-Euclidian geometry, and the momentous revolution brought about in the field of natural philosophy during these last years, have thrown strong doubts on the self-evidence of the fundamental concepts of geometry, and the basic notions of Newtonian mechanics. It is argued now, that only æsthetical considerations and psychological reasons of formal economy and utility could justify the privileged position of the axioms of these sciences. The practice, for example, of seeing in a distance two marked positions on a practically rigid body is something which is lodged deeply in our habit of thought. We are accustomed further to regard three points as being situated on a straight line, if their apparent positions can be made to coincide for observation with one eye, under suitable choice of our place of observation. If, in pursuance of our habit of thought, we now supplement the propositions of Euclidian geometry by the single proposition that two points on a practically rigid body always correspond to the same distance or line-interval, independently of any changes in position to which we may subject the body, the propositions of Euclidian geometry then resolve themselves into propositions on the possible relative position of practically rigid bodies.*

One is led then to suppose that the truths of geometry and mechanics reach a unique level. As Professor Painlevé says, there is no essential difference between geometry and mechanics;†

* Einstein, *Relativity*, Chap. I.

† Painlevé, *La Mécanique*, in *Méthode des Sciences*, vol. i.

both are experimental sciences, although their developments have been different; the axioms of pure geometry are nothing else but the refined form of the properties of natural bodies. And Böcher writes: "Geometry becomes the simplest of the natural sciences, and its axioms are of the nature of physical laws, to be tested by experience and to be regarded as true only within the limits of the errors of observation."*

Professor Einstein has a different opinion, when he writes in his book on *Relativity* that the concept "true" does not tally with the assertions of pure geometry, because by the word "true" we are eventually in the habit of designating always the correspondence with a "real" object; geometry, however, is not concerned with the relations of the ideas involved in it to objects of experience, but only with the logical connexion of the ideas among themselves.† Poincaré had already said: "Geometry is not an experimental science; experience forms merely the occasion for our reflecting upon the geometrical ideas which pre-exist within us."‡

And Professor Eddington answering the question whether it is true to say that "any two sides of a triangle are together greater than the third side," says he is quite unable to say whether this proposition is true or not. "I can deduce it," he continues, "from certain other propositions still more elementary, the axioms; if these are true, the proposition is true; if the axioms are not true, the proposition is not true universally; whether the axioms are true or not, I cannot say, and it is outside my province to consider. But for reasons which I do not profess to understand, my friend the physicist is more interested in Euclidian geometry and is continually setting us problems in it."§

All these conflicting opinions are unilateral. For the

* *Bulletin Amer. Math. Soc.* [2], 2 (1904), p. 124.

† Einstein, *Relativity*, Chap. I.

‡ "Foundations of Geometry," in *Monist*, 9 (1899), p. 41.

§ Eddington, *Space, Time and Gravitation*, Chap. I.

contention of physicists that no system of geometry can be taken as true is based on the fact that they consider geometry with reference to natural phenomena, and fail to take it as an independent science, formally irrelevant to a description of the universe. We must remember here, that truth has two aspects: a formal and a material aspect. A proposition is said to be formally true, either when its terms are not contradictory, or when it can be deduced, by means of reasoning, from a coherent system of primitive notions and axioms relatively to which it is said to be true. The material aspect of truth is of a more complex character; for we have to deal here not only with thought, but also with facts, that is to say with data of intuition and experience. Material truth requires the agreement of thinking with experience, while formal truth is caused by the self-agreement of thought. It follows that a proposition can be formally true and materially false; for instance, when we say that "the hypervolume of a hypersphere is equal to its volume multiplied by one-fourth of its radius" this statement is formally true, but it is not verifiable by experience and is therefore materially false. This distinction between the two aspects of truth is of great importance, because it gives the clue to the specific difference between pure geometry and applied mechanics. It will be observed also that we take truth in the scholastic sense of *adequatio rei et intellectus*; but we extend the meaning of the word "res" not only to objects of the external world, but also to objects created by thought.

Now, although the ultimate basis of geometry is empirical, it must be acknowledged that the active rôle of experience ceases when the primitive notions and postulates of geometry are established. Geometry belongs then to the conceptual order and constitutes what is called "axiomatic geometry," a kind of hypothetico-deductive system. As such, pure geometry sets out from certain primitive notions, such as "point," "straight line," "plane," which are not defined and with which we are able to associate more or less definite ideas, and from certain

simple propositions or axioms, or postulates, which, in virtue of these ideas, we are inclined to accept as respecting the laws of thought. These axioms state certain relations between the primitive notions, which are thus supplemented and universally characterized. When, on the basis of a logical process common to all sciences, the justification of which we feel ourselves compelled to admit, all remaining propositions are shown to follow from those axioms, they are proved.

But if there is no difficulty about the truth of a geometrical proposition deduced from a coherent set of axioms, what about the truth of the axioms themselves? This question is unanswerable by the methods of geometry; but it is not in itself entirely without meaning, as Einstein says. Without going far into the essence of geometrical axioms, we can say that they are true in so far as they express possible relations between primitive notions, undefined in the realm of geometry, but having a limited field of indetermination by reason of the intuitive data which preside at their formation. Geometrical axioms are true, because in the conceptual order, thought binds itself with the results of its normal activity.

The case of physical axioms is different, for they are always subject to some discussion and susceptible of being overthrown or contradicted by some new discoveries, while geometrical axioms are immutable in themselves. The reason of the revisibility of physical postulates lies in the very object of physical science. Having observed a series of natural phenomena, the physicist has to classify them in order to stabilize his observations and deduce from them the laws which are to constitute science. But the external world does not give our senses any presentations of natural laws. Like the ancient Sphynx, nature does not give away her secrets: the mind has to guess them. How is it done? How do we proceed successfully from particular observations to those universal laws presenting the harmony of the universe? The only way is to form hypotheses based on analogies: by an act of imagination, human mind can

suppose between the observed facts some possible relations which are tried afterwards by means of experimentation. Thus Kepler, led by metaphysical considerations, thought that the stars must obey certain laws in their motion; and only much later was he able to verify that his observations coincided with the constructions of his imagination.

There is no difficulty about the truth of what we observe and what we experience because of the simplicity of sense-perception. The whole question of truth, in physics, lies then entirely in the modality of the hypotheses. Although a physical hypothesis is an act of imagination, and therefore subject to the laws of thought, it is by no means a free creation of the mind, a convention similar to geometrical axioms. For if the latter have only to be coherent between themselves in a definite system, and are irrelevant to their actual interpretation, the former must satisfy a further condition, which is far more complicated: a physical hypothesis must necessarily lead to the explanation of the group of phenomena through which it developed, and also of the new phenomena which observation will bring in that group. Nature cannot obey the fancies of our imagination; we have to find out her own laws and obey them first. If geometry deals with formal relations between indefinable concepts without considering the content of these concepts, the physicist has especially to care about that content itself. He is not at liberty to play with mathematical symbols; for he has to struggle with a reality which sets limits, wide enough however, to his imagination.

For instance, the compression of gases is at first proportional to the exerted pressure; but then, parting with its mathematical expression, it becomes smaller and smaller. In the same way, it is always possible to increase steadily the speed of a train; but the stability of the railroad, the strength of the materials in use, the structural elements of the engine, impose an irrefragable limit upon the practicability of the calculations. Then again, mathematics can build up a most wonderful

theory of hyperpolyhedra, but there is no matter to which the conclusions of such systems can be applied. It is a truism that the science of the possible is infinite; but it is the sanction of reality which gives a material value to an hypothesis.

Let us illustrate with a general example the contrast between geometry and physics. By means of the Euclidian geometry and the Galilean system of co-ordinates, Newton, considering space and time as two absolutes, had been able to give a mathematical expression to his immortal law of gravitation. Now the evolution of science has led Professor Einstein to give a different law of the universal attraction, by means of Minkowski's four-dimensional Universe and Riemann's generalization of the Gaussian system of co-ordinates. The difference of the two laws may be expressed analytically, in polar co-ordinates for a particle of gravitational mass, m , as follows: Any particle of light pulse moves so that the integral of the interval, ds , between two points of its path, in four dimensions, is stationary where

$$ds^2 = -\gamma^{-1}dr^2 - r^2d\theta^2 + \gamma dt^2 \text{ (Einstein),}$$

$$ds^2 = -dr^2 - r^2d\theta^2 + \gamma dt^2 \text{ (Newton),}$$

considering that $\gamma = 1 - 2m/r$.

The two laws differ then by the factor multiplying the term dr^2 . Which corresponds to the external world? Three crucial tests were predicted by Einstein to meet this question: (1) the determination of the discrepancy of the perihelion of Mercury, (2) the deflection of a ray of light passing near a great mass like the sun, (3) the displacement of the lines of the spectrum towards the red in a gravitational field. The story of these historical tests is well known; with certain restrictions for the third one, they all verify Einstein's law, which is then to be considered as the true law of gravitation, while Newton's law is but a limiting case of Einstein's General Principle of Relativity.

But if these laws are considered as logical consequences of two hypothetico-deductive systems starting with different postulates, both of them are formally true; and their difference is but a consequence of the fundamental conceptions underlying Newton's and Einstein's mechanics, which, however, in themselves are also true. It is the content of experience, expressed by these laws, which influences their material truth.

The contrast between the methods of geometry and physics based on the distinction between formal and material truth, shows easily how meaningless is the question of the true geometry of the universe.

From Lobatchefski to Einstein, a long series of mathematicians thought it possible to determine the geometry of the universe. For them the question: According to the laws of what geometry do the natural bodies behave? has a precise meaning which could be worked out by experimental tests. In other words, the question whether Euclidian, or Lobatchefskian, or Riemannian geometry corresponds to the external world, can be answered experimentally, within the limits of errors of observation. We must only assume that light propagates in a straight line, and that every measure of length, whether geodesic or astronomical, is to be calculated by means of the propagation of light.

The experiment imagined by Lobatchefski and Bolyai, the originators of what Schweikart calls "astral geometry," was very simple. By measuring the three interior angles of a large triangle, they thought to verify whether that sum is equal, less or greater than two right angles. In the first case, space would be Euclidian; in the second case, it would be Lobatchefskian; and in the third case, it would be Riemannian. And, as Legendre proved it, the verification for one triangle must stand good for any other triangle. Gauss had already attempted a similar experiment: while Kant was endeavouring to show the psychological character of spatial intuition, and deduce its physical meaning, Gauss had undertaken more

accurate geodesic measurements of triangulation in the Hartz Valley.

But all these observations proved negative: space presented itself as Euclidian. Nevertheless there was an idea amongst men of science, that more accurate observations and the development of the mechanical consequences of non-Euclidian geometry with regard to astronomical problems, would certainly favour the legitimacy of non-Euclidian postulates as physical hypotheses. This was done by Einstein, when he built up his theory of Relativity by means of Riemann's geometrical conceptions. As a matter of fact, without the wonderful development of non-Euclidian geometry, Einstein's achievement would have been impossible. But are we to conclude, with him, that the geometry of the universe is not Euclidian? This affirmation is simply too bold and premature, for it has no real import. And we must confess that Einstein's cosmological considerations on this topic are the least convincing portion of his work.

Euclidian geometry, says Einstein, must be abandoned, because in a system of reference rotating relatively to a system at rest, the geometrical behaviour of the bodies, which are affected by the Fitzgerald-Lorentz contraction, does not correspond to Euclidian geometry. In simpler words, the path of moving bodies in nature is never a Euclidian straight line, because of the action of gravitational fields, which is always effective; the universe therefore, is not Euclidian.

The fallacy of this argument is easily seen, if we point out that because the path of a moving body is influenced by the presence of gravitational fields, it does not follow at all that the Euclidian straight line path is not there. As a matter of fact, it is there, although not actually followed by the moving body. Let us consider for a moment a photograph of the solar eclipse of May, 1919. We see plainly the magnificent curve described by the rays of light of remote stars passing near the sun; but at the same time, we see that there is a Euclidian

straight line path between these very stars and the point where their rays of light touch the earth. It is not followed by these rays of light, because, according to the Principle of Least Action, the shortest way between two points in a spatio-temporal continuum is influenced by the presence of gravitational fields. And this is so far true that if the sun, which causes the gravitational field in this case, were taken further and further away, the path of these same rays of light would have a decreasing curvature, thus tending asymptotically towards a Euclidian straight line. That path would be adequately Euclidian, if *per impossibile* the sun and all other gravitational fields were removed from the universe.

Another argument familiar to relativists is that the geometry of the universe cannot be Euclidian, because Einstein's theory is based on Riemannian geometry, where space is curved and the straight line illimited but finite. This argument, however, looked through its adequate proportion, means only that Riemann's geometry is more convenient than any other for the description of the universe. In fact, there is a principle in the theory of groups of transformations, called the Principle of Equivalence, which enabled Poincaré, Klein and others to transpose any system of metrical geometry into any other. By means of a biunivocal correspondence, illustrated with an appropriate vocabulary, between two geometries, any Riemannian concept, for instance, is shown to be equivalent to a Euclidian concept. It follows then, that the group of natural phenomena explained by the theory of Relativity can be interpreted by means of Euclidian geometry: as axiomatic geometry alone makes no affirmations on the reality accessible to experience, but only axiomatic geometry completed with physical propositions, it is possible, whatever be the nature of reality, to keep Euclidian geometry. Geometry [G] does not enunciate anything on the behaviour of real objects, but geometry together with the sum [P] of physical laws; it is the sum [G + P] which can be checked by experience. It is then

always possible to take [G] as Euclidian and make appropriate assumptions with reference to some parts of [P]; it is only necessary to take the remainder of [P] such as the sum $[G + P]$ is in agreement with experience. In the case of Relativity, however, it is more convenient and less complicated to describe the universe as Riemannian. Convenience is then the condition of the choice of the world's geometry; and we must draw the attention to the word "description" in physical science, which has the profoundest significance for Epistemology.* Because a description is always by means of the accidents: the essence of the thing described is left untouched by this operation.

Now we come to the ontological aspect of our argument. With all the essential difference between the object and method of geometry and of physics, there must be a close connexion between these two disciplines. Because, on the one hand, physical sciences cannot reach their actual degree of certitude without the help of mathematics, and on the other hand, mathematics would be useless if it had no practical value, considering also that its origin is empirical. In fact, when the thinking person stops to reflect upon the fact that the existence of Neptune was pointed out to the astronomer before his telescope had noticed this wanderer in the remote heavens; when he learns that the mathematician by a theory related to the solution of the problem of finding the roots of an algebraic equation, is able to say that there are not more than thirty-two distinct types of crystals; when he remembers that the existence of wireless telegraphy is due to deductions of Maxwell by means of theorems that depend upon imaginary quantities; when, to give a last instance, he considers that the abstruse non-Euclidian geometry of Riemann and the tortuous theory of absolute

* D. Wrinch, "On certain Methodological Aspects of the Theory of Relativity," in *Mind*, April, 1922; and B. Russell, *Introduction to Mathematical Philosophy*.

differential calculus of Ricci and Levi-Civita enabled Einstein to work out his momentous law of gravitation, which is, as says Sir J. J. Thomson, one of the highest achievements of human thought; he will undoubtedly endeavour to penetrate this mysterious riddle which has perplexed all the great seekers of the unknown: How is it possible that geometry and mathematics in general, which are constructions of the human mind, independent, in their structure and development, of all experience, adapt themselves so wonderfully to the objects of reality? Is Reason able to discover by its sole activity, the very properties of the existing universe?

By denying the reality of matter for the benefit of extension, Descartes was led to the conclusion that geometry and mathematics in general (because of his invention of analytical geometry) are the science of Reality, the science which could penetrate the ultimate essence of its object; and Nature would be completely known when the edifice of mathematics would be completed. And the modern style logicist, with all the restrictions he makes in the Cartesian doctrine, still holds that Reason is the ruler of things as well as the ruler of thought. For him, mathematics, mechanics, physics and every science which uses mathematical expressions are a developed aspect of logic; so that there is no incompatibility between the laws of chemistry, for instance, and the laws of thought, as Leibniz said, *Dum Deus calculat fit mundus*.

But on the other hand, we must remember that when the mathematician tries his creative power of imagination on ideal constructions, he does not think of any practical utilization of the results he obtains. While to the physicist mathematical systems are operators enabling him to act more successfully on matter, to the mathematician the construction of an abstract theory is an end in itself independently of its applications. As Professor Bouasse says, the creator of new mathematical forms does not care whether his inventions correspond to some reality. The forms in themselves interest

him more than anything else, for they enlarge the ready-reckoner of mathematical forms. It is another question whether in a near or remote future, physical phenomena will consent to lodge in those structures. The algebraist prepares in advance sets of moulds which will be utilized by the physicist according to his convenience. But he does not think of that convenience when he makes them; although history shows us that many times the solution of a physical problem has led physicists to invent new mathematical forms, as for example, when the ideas of Faraday led Maxwell to the mathematical exposition of the electromagnetic theory.

The independence of mathematicians towards reality is shown by the fact that a great number of mathematical and specially of geometrical constructions do not find or rather cannot have a corresponding reality. We have mentioned the theory of hyperpolyhedra which has no application in nature. In the same way it is impossible to give an adequate geometrical description of a flower. Nature is far more complicated than geometry and mathematics; so that if we are to describe the external world, mathematics must be supplemented with qualitative principles. It is certain then that mathematics are not at all co-extensive with reality: On the one hand, reality outruns them by its imprevisibility; and on the other hand, it is overstepped by them by all the distance between existence and possibility.

However, it is always possible to reconcile the real with that overwhelming creation of virtual relations. For Reason, however disinterested one may think it, has a utilitarian function. With the same activity, reason deduces a proposition from other propositions, and relations between natural phenomena. If quantitative relations, which are the object of mathematics, agree with the laws of nature as well as with the laws of thought, it is because of the conformity of the order in nature and the order in thought. We are adapted to our environment, to the world in which we live, in such a way as to make possible not only our material living, but also our

intellectual development. Neither our sensible organs, nor our intellect could attain their normal development if there were an incompatibility between human mind and the external world, if our previsions, based on undeniable observations, led us to untrue conclusions with regard to similar observations. If science is power, it is because our reason, in its attempt to comprehend nature, gives us thereby the necessary means to act on it. We are therefore convinced that the universe has its laws and that we are able to penetrate them; we are convinced that the external world cannot change its laws, in the same way as we cannot change the laws of thought; we feel, so to speak, that Reality binds us with it, in an insuperable circle.

In this stage of reflection, the thinker has to face a last aspect of the problem, which is by far the most alarming. If the alliance between mathematics and physics is undeniable, does science explain things as they are? Are science and reality identical? The great physicist, Duhem, denied that science can explain everything. For him, a physical theory is but an attempt towards a symbolic representation of Reality, and not an explanatory inquiry about the real. "A physical theory," he states, "is an abstract system which sums up and classifies logically a group of experimental laws, without pretending to explain them."* An eminent mathematician and philosopher, Professor Le Roy, goes further, when he says that not only physical theories are symbolic and conventional, but that scientific facts themselves are mere creations of our mind. For him, science is made up of conventions, whence its apparent truth. But scientific facts, and *a fortiori* scientific laws, are artificial creations of the scientist himself. Science, therefore, cannot teach us anything about reality; it can only be used as a rule of action.

We could hardly expect any other from a distinguished follower of Bergson. Yet at the same time we maintain that it

* Duhem, *La Théorie Physique: Sa Structure*.

is impossible for science to be anti-intellectualistic : science must be intellectualistic, or it will not be at all. We take science as a logical classification of facts, as a means of putting together certain observations which are apparently separated, although they are really linked by some hidden but natural necessity. But a logical classification is an explanation by the natural causes ; because its object is not to reveal to us any order in nature, save the order existing in things, the intimate relations between objects of reality ; if possible the plan of nature itself. It is not the privilege of reason to create physical laws, but only to utilize them when discovered. We cannot pretend however, that science gives us the comprehension of the true essence of things. If we get every day nearer and nearer to the knowledge of reality, we must confess at the same time, that we are still, with respect to the ultimate mechanism of things, in the position of an engineer towards a machine of which a few organs only are visible, the remainder being still inaccessible to him. The reason of our ignorance is simple : it is the materiality of human means of perception, which hinders our comprehension of the ultimate nature of things. Besides, whatever has relations to things distinct from itself, could not be what it is, if those different things did not exist ; and therefore we cannot know a thing as it is, unless we know all its relations to all the other things in the universe. We cannot hope then to penetrate adequately the essence of things, although we must be convinced, with the great mineralogist Lapparent, that science progresses by successive approximations towards an adequate explanation of the relations between sensible things. Scientific certitude may be considered as asymptotic, because of the hypothetical character of scientific theories. Science and reality are not, therefore, congruent : the evolution of our knowledge and the nature of things are in the relation of a science-curve to its reality-asymptote.

But at the same time, we must acknowledge that every day

we make a new conquest over the unknown, which remains for us a definite acquisition. Although scientific theories cannot be looked upon as an adequate knowledge of Nature, because Reality is necessarily refracted by the mental factors of our general constructions, yet our knowledge of particular facts and even of limited groups of facts related between themselves, can be materially true, independently of the scientific theories with which they may agree. If then, the evolution of the various physical theories from the early Greek philosophers up to the present day seems to prove a constant failure of theoretical science, we must realize that, amongst what are considered to be ruins in an old physical theory, there remains a certain invariant which makes the very value of the new theories. Light, for instance, is subject to gravitation; Newton knew it and gave the figures for the deflection of rays of light grazing the sun. Einstein, by means of a new theory, corrects Newton's formula, as we know. But whatever be the exact amount of that deflection, whatever be the primitive assumptions of the theories predicting that deflection, the fact is there; the deflection of the rays of light grazing the sun is an invariant which subsists whatever be the fortune of the physical systems which try to account for it. So, by calling a fact "desoxydation" or "phlogistication" we do not change the fact as such: its expression only is altered. The same again, we may call a geometrical entity a "Euclidian circumference" or a "Riemannian straight line" in the antipodal system, without altering its very nature. In other words, the essence of a thing does not change when its meaning is expressed in English, in French or in German.

We do not go, however, as far as to say that science is a well-made language, as Locke contends; for us, science is not only a nominalistic system of coherent relations between indefinables, but the expression of true relations between real objects. Sensible things, for which the word "object" has been invented, are really objects and not fugitive and unseizable appearances. When we ask then what is the value of science,

we do not mean does science enable us to comprehend the very essence of things, but does it enable us to understand the true relations of things? And science has lived long enough to prove the stability of its particular constructions. As Poincaré says, through the evolution of scientific systems, there is something which is always there, always present, definitely acquired, and that something is the essential.

It could not be otherwise. For changes do not happen in the laws of nature or in natural facts, but in the way in which we conceive and express them. Reality is immutable; our interpretations of it are, however, conditioned by the necessity and the adequacy of the data on which we base our solutions. One may argue here that, if the world is rational, we ought not to make mistakes in the expression of its laws. But if we know thoroughly the laws of our mind, we are not quite sure about the laws of nature. The materiality of our being is an obstacle to our immediate knowledge of things as they are. We have to reason first about appearances, and, naturally, commit errors. Our convictions, even reasoned, are not a sufficient guarantee of truth.

We conclude, then, by saying, that science has a value independently of our reason. The reality of the external world is certainly independent of the eyes which see it, of the hands which touch it, of thought itself. Reality is not created in and by empirical experience; it exists ready-made outside and prior to experience. In that sense, we can say that the content of science is reality. So that if, *per impossibile*, mankind were annihilated, science would undoubtedly disappear as such. But its content would still be there; nature would continue its performance according to the same laws; the spectators only would be missing.

*Meeting of the Aristotelian Society at 21, Gower Street, W.C. 1,
on July 3rd, 1922, at 8 P.M.*

XII.—BENEDETTO CROCE'S "HISTORIOGRAPHY."

By DOUGLAS AINSLIE.

I.

IN Benedetto Croce's "Philosophy of the Spirit," as it appears to me, the West looks the East full in the face and then deliberately turns its back. Life is Reality lived as traditionally it has been lived in Europe during historical time. The mystical Reality of the Vedanta and other Indian systems is the illusion. This point of view finds expression in the work on the nature of History and of History writing now before us, where it is maintained that History is equal to Philosophy and identical with it, as the universal is identical with the particular.

What is the chief problem of modern philosophy? Surely it is that of solving the dualism between nature and spirit, between the known and the unknown, between subjective and objective reality. But the dualism seems often to persist. With Bergson, for instance, the vital impulse is left standing side by side with life and leads to a dualism, and in this respect he appears to step backward behind Hegel, who at any rate sought the constant surpassing of the fact by the act in the logical synthesis of his categories.

Croce and Gentile—for to his long discussions with Gentile Croce has said that we owe the original conception of the identity of Philosophy and History, afterwards worked out and much developed in the present volume—regard the concretions of reality as being all comprised in the act of the spirit, which knows nothing but itself, includes within itself its whole history, which is divine history, realizing in the expression of

itself every fact, every thought, all doing and all thinking, for they are one.

This notion is developed in the three hundred and odd pages of the *Historiography*. But here in the actual writing of his book, Croce shows how widely he differs from Gentile and the school of Absolutists proceeding from him and headed by De Ruggiero. Croce says somewhere that he is essentially a methodologist, and it is largely in Croce's sureness of vision, in his sense for what is in its place morally, aesthetically or logically, that the world as a living whole will find its advantage. For Croce the Spirit consists of certain eternal categories, of which History is one ~~of these~~ and is identical with philosophy: "Spirit which is the world is the Spirit which develops, and is therefore both one and diverse, an eternal solution and an eternal problem: philosophy is its self-consciousness, which is its history, or history which is its philosophy, each substantially identical with the other; consciousness is identical with self-consciousness, that is to say, both distinct from and one with it, as life and thought." He goes on to say that we are able to recognize ourselves in the thoughts of other men, which are also our thoughts.

What is the difference between contemporary and past history. Croce replies to this with one of his celebrated paradoxes involving the discovery of a truth by declaring simply that all history is contemporary history. He does not arrive at this position without a good deal of hatchet work in the brushwood of myth and allegory, and an exhaustive treatment of chronicle, which is defined as temporarily dead history. History is *dead* until it is lived again in thought, and every history becomes chronicle until it is revived in the historian's mind. This distinction is a formal distinction, that is to say, truly real. The opposite of what most of us were taught at college is the case: history comes first, then chronicle: first the living being, then the corpse, which can be breathed upon by the Spirit and again filled with the

breath of life—with the life of history which is also the life of philosophy, since philosophy conditions the history of philosophy. For although philosophy always appears as the necessary antecedent of the history of philosophy, it must also always be understood as *knowledge* of the history of philosophy, since, as Gentile says, it must prepare and condition actual philosophy. He also meets the objection that we are here in the presence of a vicious circle, with the remark that closer reflection shows that this circle is not vicious, but as Rosmini, following Zabarella (of the XVth century), declared of others like it, *solid*. From this identity of philosophy and history, it is clear that we cannot distinguish between a historical and a systematic treatment of philosophy.

I remarked a little way back that Gentile had been the instigator of the views as to the identity of History and Philosophy expounded in this volume. But although this is perfectly true in general, yet Croce maintains that philosophy is the methodology of history, since it furnishes the explanation for the categories which constitute historical judgments, and is always in proportion to the philosophical capacity of the historian. It is to be understood that what is fundamental historically is not subject to chronological process. Gentile suggests that Croce does not himself altogether escape transcendentalism, for although he maintains that there is no fundamental or general philosophical problem, yet he himself cannot avoid distinguishing a secondary and episodic part from a principal and fundamental part (as in *Nuovi Saggi*, p. 104). Croce would certainly reply to this that such a distinction as he there makes has merely an episodic or didactic value. Gentile insists that the unity which forms the basis of philosophy and of history is philosophy and not historiography, the universal and not the particular, in which the intellectual activity manifests itself. For Croce they would be convertible, for Gentile there is primacy of philosophy. Gentile talks of the real unity underlying the apparent

distinctions in the development of the concept of art as described by Croce. He holds that Croce's concept of art is developing as he criticizes the various distinctions, and that this development is the only problem of æsthetic, analogous to the only problem of philosophy in general.

II.

A great part of the *Historiography* is, as I have said, hatchet work among the brushwood. Thus of the philologists he remarks epigrammatically that they ingenuously believe themselves to have locked up History in their archives, like Scheherazade of the *Arabian Nights Entertainment*, and that they are really writing history when they pour the contents of one book into another. With the intention of defending their fortress, they have created an atmosphere of doubt and uncertainty in their conclusions, which they ingenuously believe to be for that reason peculiarly wise and satisfying. But this fear of pushing criticism as far as it will go in the search for truth is really lack of intelligence disguised as moderation which "chips off the edges from the antitheses which it fails to solve." Thought should always and everywhere be audacious; it should never fear itself.

Is this agnosticism of philological history remedied by grading subjects according to the criterion of values? Croce says, No, since history is always a history of values, and thus of thought, independent of and indifferent to feeling, which is essential in the sphere of poetry. But the personal element in this shape of feeling must be banished from true history. Not so, however, that imagination which is inseparable from the historical synthesis, the imagination of thought active with itself in determining a given concrete situation. In the search for historical truth all those feelings that may have been upsurging in our breasts but a short time before, must vanish before the light of truth attained by the historical judgment.

Is there anything to be said in favour of writers such as

Buckle and the Positivists, who wish to make history what they call scientific, a thing of weights and measures, or as they term it, of observation and experiment? No, for they would reduce history to its pale derivative, natural science. History being eternally contemporary, will yet eternally fail to satisfy us, because, as we construct it, new facts, a new situation, is elicited by our very treatment, asking a new solution.

With this refutation of the possibility of natural scientific history may be coupled the refutation of philological and poetical history. None of these forms can be destroyed, because they are errors, and therefore not facts. They are negative moments of the spirit in its dialectic. Error is not an evil, but an Ariel breathing everywhere and inciting to its own death, from which comes forth another error perhaps, yet even more beautiful and stimulating than the one that has given it birth and has by it been slain. The best example of this eternal formation of truth from error is our own personal history when dealing with historical material. We feel our sympathies and antipathies aroused by the narrative and by the behaviour of the different personages that cross and recross the scene: this is the poetical moment, which may be followed by a rhetorical moment reflecting our own practical tendencies; then may ensue a philological moment, if we are inclined to dwell upon the accuracy or the reverse of narrative. All these forms are in time superseded, and having done this, we reach "a new and more profound historical truth."

An excellent example of the fruitfulness of *hypercriticism* is the application of it to the notion of a Universal History. Such a history would eventually lead to the madhouse, for were we to imagine all possible historical questions answered, others infinite would arise from these and we should enter upon a vertiginous path of progress to the infinite, which is "as wide as the road to hell, and if it does not lead there, certainly does lead to the madhouse." So we come back to the concrete, to that concentration upon one vital point which offers a definite

problem for solution and is contemporary history, whether it occurred to-day, last year, or prior to the birth of Buddha.

As regards the philosophical universal in its distinction from the above use of the term in ordinary parlance, history must be regarded as thought, thought of the universal in its concreteness, which is always determined in a particular manner. The notions of subject and predicate which appear in the historical judgment must give way to the notion of thought, in which "the true subject of history becomes the predicate and the true predicate the subject," the universal is determined in the judgment by individualization. Thus is destroyed the false dualism of truths of reason (philosophy) and of fact (history), contained in the distinction between knowing and understanding, supposed to occupy separate compartments of the mind, as though one should be able to know without understanding, or inversely. Thus is abolished the notion of universal history, and with it that of universal philosophy, in the sense of a closed system.

III.

Deterministic history is at first sight opposed to the so-called philosophy of history, but they are found inevitably to call forth one another, because the determinist must stop somewhere in his search for causes in order to make a beginning. This beginning is transcendental, whether it be found in the interplay of atoms or in the Unconscious or elsewhere. Call them what we will, they are conceived as external to the spirit, which is helpless before these apparently opaque entities. But what are these entities called facts which have incurred the displeasure of the philosophers from Aristotle to Kant? The answer is that as facts they do not exist at all. It is the spirit which makes the external facts in its search for causes, thus employing a procedure not different from that of natural science which analyses and classifies reality abstractly.

Let us look these brute facts in the face and what do we see? We see "the light of thought resplendent upon their

foreheads": this is the true point of departure which is also the point of arrival, for brute facts are history not only in its construction but in its self-construction. A corollary to this is that from the days of the Greeks (to use a conventional phrase) history has ever been growing richer. We know the causes of civilization as little as did the Greeks, but we know the theory of civilization better than they knew it—we know, for instance, that poetry is an eternal form of the human spirit, and this they did not know or only understood obscurely. And so on through various phases of transcendentalism and false immanence until we come to the philosophy of history fashionable to-day, that of progress and civilization, which by some is believed to depend upon the discoveries of natural science.

But the philosophy of history always carries with it a transcendental element, something external to it, and it is not until this veil, of whatever substance it may be composed, is destroyed, that philosophy of history *dies*, to be immediately born again as, simply, history. This leads to the consideration of the problem of progress and decadence. What are these? For Croce they cannot be taken separately but if combined yield *circularity*, which is perpetually identical and perpetually diverse, and thus constitute the notion of development. Thus, too, there is no attainment of a positive end in history external to itself conceived as attainable either in time or only as infinitely to be approximated, but where the end is conceived as internal, that is to say, as development, we must hold that it is attained and a new prospect not yet attained at every instant. Finally, progress from evil to good or decadence from good to evil must be taken as really the passage from good to better, in which evil is "the good itself seen in the light of the better." I omit for reasons of space the illustrative proofs of this given by Croce in which, for instance, he shows how the middle ages really represent an advance upon antiquity, although at the period of the Renaissance the opposite was believed.

Should history take sides? Yes, it should take *both* sides

and give by thought a judgment upon life that has once been lived. Where patriotism or other practical elements appear we cannot have altogether unbiassed history, and it is probable that all history contains some element of the practical. History cannot be said even to have begun until all feelings of partisanship have been superseded and at least an attempt is made to see that the particular epoch or event in question actually did contribute to the period during which it appeared. All epochs and all events are productive of something, and all represent progress in respect of their predecessors though it is admittedly difficult, for instance, to discern the progress of say the Ninth Century A.D. as compared with the Fourth Century B.C. It is perfectly true that every particular person, institution, work, and thought is destined to perish and that the truth which it represented will also perish, though many people are apt to attach themselves so strongly to what interests them that they "attribute the immortality which belongs to the spirit in universal to one of its particular forms." *Tout passe, tout casse, tout lasse*, is true in one sense—the empirical—false in the other—the universal—for history does not die like the individual who in the words of Alcmæon of Crete is unable τὴν ἀρχὴν τῷ τέλει προσάψαι, it lives eternally because "it always joins the beginning to the end."

IV.

Are there certain facts worthy of history and others which must be banished from its content, as Hegel and others have believed? No, each and every fact *may* be of value to the historian. There is no logical criterion of choice, "for the criterion is the choice itself conditioned by knowledge of the actual situation." History must not be here confounded with erudition and the methods of the one transferred to the other. There is no fear of being overwhelmed with details because the problem of every historian is prepared for him on every occasion by life and is always solved by thought "which passes from the confusion of life to the distinctness of consciousness" in a

manner similar to the appearance of art emerging from the obscurity of mere feeling to the clarity of representation.

The conception of History as that which has its end and explanation not outside but within itself, which is not external to philosophy but coincides with philosophy, amounts to an identification of History with thought itself which is always both philosophy and history. Thus like an invalid set free from the props and plasters of the doctors history rises—for the first time in the course of history—to its own full height and contemplates philosophy face to face as equal and identical with it. But the objection may here be made: You have truly freed history from its trammels, but what is now left for us, since the individual is shown to be equivalent to the universal, other than absorption in God: mysticism? The answer to this is that mysticism is by nature negative, it is the negation of empirical distinctions, which certainly leave thought free of illusions but not yet full of itself. Mysticism is a violent reaction from naturalism and transcendentalism but retains traces of what it has negated. A really efficacious negation of the above thesis is brought about not by mysticism but by *idealism* in the unity which is distinction. The act of thought is the consciousness of the spirit as self-consciousness and this implies distinction between "object and subject, theory and practice, thought and will, universal and particular, imagination and intellect, utility and morality." To think is to judge, and the two terms of which such thought consists are not two discreet realities but are the *one reality* of *dialectical* unity. Thus when the will-o'-the-wisps of empiricism have been extinguished, darkness does not supervene, because the light of the distinction is to be found in history itself, which is the intrinsic knowledge of facts. Here its unity with philosophy becomes yet more evident, because "the better philosophy penetrates its own distinctions, the better it penetrates the particular, and the closer its embrace of the particular, the closer its possession of its own proper conceptions."

Since there is no such thing as general or universal history opposed to special histories, the distrust of so-called pure philosophers, pure politicians, pure economists, is explained, for it is felt that these individuals, owing to their one-sidedness, fail to understand even their own speciality, which they have reduced to the form of a skeleton by abstracting from it the flesh and blood of life. Hence the demand that historians shall acquire universal minds, and that their histories, although perforce they will omit very much, shall be also in a way universal.

Read at the Joint Session of the Aristotelian Society, the British Psychological Society, and the Mind Association at Hulme Hall, Manchester, July 16th, 1922.

XIII.—THE PHILOSOPHICAL ASPECTS OF THE PRINCIPLE OF RELATIVITY.

By A. N. WHITEHEAD.

THE most obvious contribution of the scientific doctrine of Relativity to the problems of philosophy is to strengthen the type of argument on which Berkeley relied. Accordingly, those systems of philosophy which rely on this type of argument thereby receive additional support. I will endeavour to explain my meaning, but I am painfully conscious that it would have been better to have had the grounds of this evening's discussion laid out by an adequately trained philosopher.

I presume that the fundamental position of idealism is that all reality can be construed as an expression of mentality. For example, I suppose that Mr. Alexander is a realist because for him mind is one among other items occurring in that evolution of complexes which is the very being of space-time. On the other hand, Mr. Wildon Carr is an idealist because he finds ultimate reality in the self-expression of monadic mentality. The test, therefore, of idealism is the refusal to conceive reality apart from explicit reference to some or all of the characteristic processes of mentality, it may be either thought, or experience, or knowledge, or the expression of valuation in the form of a historical process, the valuation being both the efficient and the final cause of the process. Now Berkeley's argument in favour of this central position of idealism is that when you examine the objects of sense-perception they are essentially personal to the observer. He enforces by a variety of illustrations the doctrine that there is nothing left when you have torn the observer out of the observation. The planet,

which is no bigger than a sixpence, is the observer's planet, and he walks off with his own property.

It stands to reason that modern relativity strengthens this argument, since previously there were two elements in our experience which the argument did not touch, I mean Space and Time. Berkeley's argument rests on the basis that appearances in space and through time are personal to the observer. But space and time were left as common facts. But now it has been shown that space and time cannot be excluded from the scope of Berkeley's argument. Accordingly you can no longer meet the argument by showing that there are exceptions to it. Hence so far as idealism is concerned with the facts of nature—and it must be concerned with them—its characteristic type of argument has been strengthened by the recent scientific bombshell. The realist is now left hugging the multiplication table as the sole common fact untouched by each immediate expression of mind. But the multiplication table is no good to a realist. It shuts him up with Plato's ideas, out of space and out of time, which is just where he does not want to be—Poor man, like Wordsworth and the rest of us, he wants to hear the throstle sing.

We seem to be left then with the idealist position that nature is nothing else than a common expression for diverse processes of mentality. I do not believe that this is the sole choice; I have been trying to sketch in a few sentences the line of thought according to which Relativity strengthens the argument for idealism. But, before proceeding, the immediate moral that I want to draw is that Berkeley must be stopped at the very beginning. The presupposition of the whole line of argument must be challenged. Later on there is no resting place.

Let us now begin again and scan carefully the main point of Berkeley's argument.

He attacks the presumption that we observe subjects as qualified by attributes, subject and attribute being independent

of ourselves. He easily—ridiculously easily—establishes this point so far as it goes, and it is the scope of this argument which is widened by the modern doctrine of relativity in physical science, so as to include time and space. The exact conclusion which we ought to draw and must draw is that the form of thought of a two-termed relation of predicate to subject imposed by the Aristotelian logic is not adequate to express the immediate deliverance of observation. A wider relativity is necessary in the sense that the fact of nature observed—the crimson cloud, to take another of Berkeley's examples—cannot be expressed in terms of the two factors "crimson" and "cloud." In other words, the proposition "the cloud is crimson" is in reality a highly elliptical form of expression and is meaningless unless the suppressed factors are supplied. In practice these suppressed factors always are supplied; in truth they are so obvious to us that it is difficult for us to believe that language has shirked its job of exposing the fact.

Furthermore, everyone would agree that in some sense the suppressed factor includes the observer. Berkeley's argument is that it stands in the essential nature of the case that different observers perceive different things. Accordingly, in the realm of things observed there can be nothing common to diverse observers. Accordingly, there is no common realm of things observed, whose interrelations can be expressed apart from reference to observers. Accordingly, the only common ground for observers is the common stock of abstract ideas which they individually apply to their diverse experiences. Furthermore, these diverse experiences now lose all claim to any objectivity other than that of being phases in the process of the self-development of the observer.

Now I see no escape from this argument provided that the concept of an "observer" is not ambiguous. Unfortunately, it is very ambiguous. Berkeley—tacitly presupposing the Aristotelian logical forms—has thereby presupposed that in the fact

observed there can only be the two-termed relation of predicate to subject, for example, "crimson to cloud." Accordingly, for him the additional factor introduced must be something underlying and in a sense creating the realm of the observed. This additional factor is accordingly (for Berkeley) the mentality of the observer which is expressing itself in these observations. In other words, for Berkeley the observer is mind, and therefore Berkeley is an idealist. But when a realist admits that—as above—the suppressed factor includes the observer, he is (or should be) using the term "observer" in a quite different sense. He is thinking of the observer's body. I do not think that for the exposition of the realist position the term "observer" is at all well-chosen. I put it in, to start with, because, after all, Berkeley started the whole train of thought, so that the idealists are entitled to the initial phraseology which suits their line of development of the argument. But whereas Berkeley puts in an additional factor, namely, mind, which underlies the whole realm observed, the additional factor added by the realists consists of other items within the realm observed. Among these other items is the body of the observer, and this is why a realist carelessly, and in a loose unsatisfactory sense of the term, may assent to the statement that the additional factor includes the observer.

But note that now the realist has admitted that the simple proposition, "the cloud is crimson," is a meaningless statement about nature unless other items of nature are implicitly included in the proposition. In other words, a fact of nature cannot be expressed in the simple two-termed relation of predication, which is the standard form of the Aristotelian logic. In allowing that it is essential to add other items of nature to crimson and the cloud in order to express the immediately apparent fact, he has admitted that the essential facts of apparent nature involve irreducible relations of more than two terms. Owing to the influence of training and custom, as embodied in the phraseology of philosophical literature, it

is habitual to us to presuppose that all relations—even if they are not that of predication—are two-termed, and to acquiesce in arguments which tacitly make this presupposition. Accordingly, it is the more necessary for me to emphasize this point, since I consider that, apart from this admission of irreducible many-termed relations, there is no escape from the full force of Berkeley's argument.

If you ask how many other items of nature enter into the relation of crimson to cloud, I think that we must answer that every other item of nature enters into it. At first sight, this would appear to make knowledge impossible for poor finite human beings. But we can classify grades of relata in this multiple relation which I term that of crimson to cloud. The lowest grade sweeps all nature into itself. It is the grade of relata whereby all nature expresses its patience for this relationship of crimson to cloud. There is no such thing as crimson lone and by itself apart from nature as involving space-time, and the same is true of cloud. The crimson cloud is essentially connected with every other item of nature by the spatio-temporality of nature, and the proposition, "the cloud is crimson" has no meaning apart from this spatio-temporality. In this way all nature is swept into the net of the relationship.

You may put it this way, nature as a system is presupposed in the crimsonness of the cloud. But a system means systematic relations between the items of a system. Accordingly, you cannot know that nature is a system unless you know what these systematic relations are. Now we cannot know these systematic relations by any observational method involving enumeration of all the items of nature. It follows that our partial knowledge must disclose a uniform type of relationship which reigns throughout the system. For if we do not know that, we know nothing: and there is simply nothing to talk about. For example, we should have no reason to believe that there is an interior to the earth, or any lapse of time apply-

ing to it. We ask whether this interior is occupied with condensed matter or is empty, and whether this matter be hot or cold, solid or gaseous, because we know that the uniform systematic spatio-temporal relations must supply entities which have the status of forming the interior of the earth.

I call this principle by which a systematic nature is known to us, the uniform significance of events. This uniform significance is disclosed to us as expressing the patience of nature for every item of our experience—for example, the crimson-ness of the cloud.

Another grade of items in the relationship "crimson to cloud" entirely lacks the uniformity which attaches to the first grade. Accordingly, in contrast to "uniformity," I will speak of its "contingency." The principle of the contingency of appearance means that a set of items of nature are presupposed in the relationship crimson to cloud, whose status in the relationship requires detailed examination in each particular instance; though the laws of nature enable us to make a shrewd guess at the types of status which are possible. But there is one item in this contingent grade which is so pre-eminent that it almost deserves a whole grade to itself. I mean the observer's body. It is an empirical fact, which in no way seems to enter into the character of knowledge as such, that our knowledge of nature consists of knowledge of those relationships for which our bodies are important members of the contingent grade of items. The cloud is crimson, as perceived by a person B, because B is aware of a certain multiple relationship involving processes within his body and other items of nature. We may put it in this way, that B is aware of nature from the standpoint of his body. Thus the relativity to an observer is dominated by the physical state of the observer's body. It is therefore relativity to his body.

Apart from the empirical fact that it so happens, I cannot convince myself that the character of awareness of nature necessarily involves this reference to the observer's body. In

the first place, it is quite easy to imagine an infinite observer, such as God, whom in this connexion I call infinite as being impartially aware of all relationships of items within nature. Each one of us is a finite observer because we are only aware of that selection among the relationships which are dominated by our body. But I cannot see that idealism would gain even if this reference to the body were absent. We can imagine that the perceptions of the sociable archangel, as he chatted with Adam and Eve in the garden, were not from the standpoint of his body, because he had no body, but that his selection of relationships observed was made on some other principle. What is essential as an argument for realism [under this heading of relativity] is that the relationships observed should form a closed system, whose characters refer to each other. There is a process of nature which is obstinately indifferent to mind. This is why I feel difficulty in assigning to mind, or knowledge, or consciousness any essential *rôle* in the flux of fact—essential, I mean, beyond the *rôles* played by other abstractions from that flux, such as chairs and tables.

I cannot persuade myself that relativity in any way weakens this obstinate indifference of nature. It simply shows that there are more various relationships within nature than we had anticipated—no new discovery, for every advance of science adds to the complexity of nature. If Einstein had established the affirmative answer to Pope's question, "Shall gravitation cease as you go by," he would have done something to advance the claims of idealism. But all he has done is to make it more difficult for us to compare our watches with those of the inhabitants of Mars, entirely owing to circumstances over which we have no control; and also he has produced a law of gravitation more complicated than that of Newton—but, again, this law depends on circumstances over which we have no control. I don't see how it is any easier to bend space now than it was to alter the strains and stresses in the ether. Accordingly, I cannot appreciate what accession

there has been to the arguments on behalf of idealism. We still find mental processes faced with an obstinately independent nature, so that the correlations of mental processes with natural processes appear as unessential for the course of natural events. I am not denying that there are such correlations, or that when they occur the natural and the mental are not the same fact with different aspects of it emphasized. But what I am denying is that some correlation with mentality can be proved to be essential for the very being of natural fact. I will summarize the foregoing discussion by saying that the modern doctrine of relativity is calculated to hearten idealists by emphasizing certain of their lines of argument, but that it does not essentially touch the validity of the controversial arguments as between the two sides.

I should, however, not like it to be concluded that I am maintaining that relativity has no philosophical importance. The general character of its importance arises from the emphasis which it throws upon relatedness. It helps philosophy resolutely to turn its back upon the false lights of the Aristotelian logic. Ultimate fact is not a mere aggregate of independent entities which are the subjects for qualities. We can never get away from an essential relatedness involving a multiplicity of relata. Every factor A, discerned as an entity within fact, expresses in its very being its capacity for the relationships into which it enters, and requires that all other factors of fact should express their capacities as relata in relationships involving it. This is the doctrine that any factor A is significant of the relationships into which it enters, and that conversely all factors within fact must express the patience of fact for A.

The more special aspect of the importance of relativity in philosophy is its treatment of space and time, particularly time. Space and time can never be mere side-shows in philosophy. Their treatment must colour the whole subsequent development of the subject. The relational treatment

of space is a well established principle, and I doubt whether relativity has made much difference here, so far as philosophers are concerned. But it has made an immense difference to the treatment of time. The unique serial character of time has gone by the board ; also a thoroughgoing relational treatment of time is now necessitated and made possible. I am told that there are phrases in Aristotle which look that way. Am I right in recollecting that he defines time as an ordering or disposition of events in respect to each other ?

Furthermore, the fusion of time with space and the dropping of the unique seriality involves the necessity of looking on ultimate fact as essentially a process. Accordingly wherever the idea of "process" has been lost, we are dealing with a very advanced type of abstraction. This is why, in treating this subject, I have always insisted that our lowest, most concrete, type of abstractions whereby we express the diversification of fact must be regarded as "events," meaning thereby a partial factor of fact which retains process.

Now I conceive that nothing of this is really new in philosophical thought. It is as old as the hills. But I still think that a scientific doctrine which enforces consistent emphasis on these ideas has the utmost importance for philosophy, even although it does not settle the established controversies between realism and idealism.

XIV.—IN MEMORIAM:

MISS E. E. CONSTANCE JONES.

MISS CONSTANCE JONES, former mistress of Girton College, who died last April at her home at Weston-super-Mare, had been for many years an active Member of the Aristotelian Society. She joined us on December 19th, 1892. Her chief interest was in logical theory, and she was the author of several manuals and primers on Logic and Ethics for the use of students. She translated, with Miss E. Hamilton, Lotze's *Microcosmus*, and had been engaged, since her retirement from Girton College, in translating Hegel's "Larger Logic." Her chief work, and that on which she claimed to have made a distinct and original advance in logical theory, is entitled *A New Law of Thought and its Logical Bearings*. It is a small monograph of only 75 pages, published by the Cambridge University Press, and containing a Preface by Professor G. F. Stout; in it is concentrated the argument she had been expounding for a long time.

The essential point for which she contended is indeed brought out clearly in the first paper which she read to the Society, "*The Import of Categorical Propositions*," published in the Proceedings, Old Series, Vol. II. In the analysis of every categorical proposition of the form *S is P* there is, she says, "*Identity of Application* of the two-terms and *Diversity of Signification*." Describing this as the Identity-in-Diversity view she then applied it to the Laws of Thought, and particularly to Lotze's treatment of the judgment of Identity, and to his attempt to justify the categorical judgment as the consequent of an antecedent hypothetical judgment. In 1911, she presented "*The New Law of Thought*" as a thesis, at the International

Congress of Philosophy at Bologna, and shortly afterwards published the little book with that title.

She was a member of our Executive Committee from 1914 to 1916. She will be remembered by all who had the privilege of knowing her and working with her for the charm and gentleness of her disposition. Intellectually, she had great force of character, and when she took part in philosophical discussion she could defend her thesis with a tenacity which derived its strength from her firm and comprehensive grasp of the problem. The following list of her papers, with the dates on which they were read, will show how continuous and constant was her interest:—

"The Import of Categorical Propositions," December 4th, 1893.

"The relation of Language to Thought" (Symposium), March 19th, 1894.

"The Rationality of Hedonism," December 3rd, 1894.

"Some Aspects of Attention," April 13th, 1896.

"Are Character and Circumstance Co-ordinate Factors in Human Life, or is either Subordinate to the Other?" (Symposium), April 27th, 1896.

"The Paradox of Inference," January 17th, 1898.

"Lotze's Theory of Concept and Judgment," February 27th, 1899.

"A Refutation of Dualism," February 19th, 1900.

"The Meaning of Sameness," March 25th, 1901.

"Professor Sidgwick's Ethics," January 4th, 1904.

"Logic and Identity in Difference," February 4th, 1907.

"A New Law of Thought," May 29th, 1911.

"A New Logic" (Dr. Mercier's), December 16th, 1912.

"The Import of Propositions" (Symposium), July 5th, 1915.

"Practical Dualism," May 6th, 1918.

ABSTRACT OF THE MINUTES OF THE PROCEEDINGS OF THE ARISTOTELIAN SOCIETY FOR THE FORTY-THIRD SESSION.

October 10th, 1921. Dr. F. C. S. Schiller, President, in the Chair.

—The President delivered the Inaugural Address on "Novelty" and invited discussion. The following members took part in the discussion.—Prof. Wildon Carr, Mr. Joad, Prof. Nunn, Prof. Whitehead, Mr. Hannay, Dr. Thomas, Mr. Cator, Mr. Ainslie and Mr. Mead.

November 7th, 1921. Prof. Dawes Hicks, Vice-President, in the Chair.—Prof. J. H. Leuba read a paper on "Intuition in Experience and in Philosophy." In the discussion Mrs. Stephen, Mr. Raknes, Mr. Mead, Mr. Davies, Mr. Ainslie, Dr. Kramerisch and Prof. Whitehead took part.

November 21st, 1921. Prof. Dawes Hicks, Vice-President, in the Chair.—Dr. F. W. Thomas read a paper on "An Indian Doctrine of Perception and Error." Mr. Cator, Mr. Mead and Mr. Hooper took part in the discussion.

December 5th, 1921. Prof. Dawes Hicks, Vice-President, in the Chair.—Prof. James Johnstone read a paper on "The Limitations of a Knowledge of Nature." Prof. Nunn, Prof. Wildon Carr, Mr. Mead, Mr. Joad, Prof. Gates and Mr. Greenwood took part in the discussion.

December 19th, 1921. Dr. F. C. S. Schiller, President, in the Chair.—Mr. F. Tavani read a paper on "Physical Space and Hyperspaces." Mr. Bertrand Russell, Dr. Wriuch, Miss Sinclair, Mr. Greenwood, Prof. Wildon Carr, Mr. Shelton, Dr. Jeffery and Dr. Goldsbrough took part in the discussion.

January 9th, 1922. Dr. F. C. S. Schiller, President, in the Chair.—The President read a paper on "Mr. Russell's *Analysis of Mind*." Mr. Joad, Prof. Hoernlé, Mr. Richardson, Mr. Ginsberg, Dr. Goldsbrough and Miss Stebbing took part in the discussion, and Mr. Bertrand Russell replied to the criticisms of his book.

January 16th, 1922. Dr. F. C. S. Schiller, President, in the Chair.

—Mr. H. J. Paton read a paper on "Plato's Theory of *εἰκασία*."

In the discussion Dean Inge, Mr. Leon and Prof. Dawes Hicks took part.

February 6th, 1922. Prof. Wildon Carr, Vice-President, in the Chair.

—Mr. A. H. Hannay read a paper on "Standards and Principles in Art."

In the discussion Mr. Ainslie, Mr. Joad, Mr. Mead, Mr. Leon, Mrs. Roberts, Mr. Cator and Prof. Plimpton Adams took part.

February 20th, 1922. Viscount Haldane, Vice-President, in the Chair.

—A Symposium on "The Idealistic Interpretation of Einstein's Theory" by Prof. Wildon Carr, Prof. Nunn, Prof. Whitehead and Dr. Dorothy Wrinch was read. The discussion was opened by the Chairman, and Mr. Joad, Mr. Mead, Dr. Jeffery and Prof. Nicholson took part.

March 6th, 1922. Prof. J. S. Mackenzie, in the Chair.—Prof.

S. N. Dasgupta read a paper on "The Logic of the Vedānta."

In the discussion Prof. Wildon Carr, Dr. Thomas, Prof. Shastri and Mr. Mead took part.

March 20th, 1922. Prof. Dawes Hicks, Vice-President, in the Chair.

—Prof. R. F. A. Hoernlé read a paper on "Some Byways of the Theory of Knowledge."

In the discussion Miss Stebbing, Mr. Joad, Prof. Wildon Carr, Mr. Cator and Mr. Ionides took part.

April 10th, 1922. Dr. F. C. S. Schiller, President, in the Chair.

—Dr. G. E. Moore opened a discussion on "Dr. McTaggart's *Nature of Existence*." Miss Stebbing, Mr. Powell and Miss Oakeley took part.

May 1st, 1922. Prof. T. P. Nunn, Treasurer, in the Chair.—Miss

McFarlane read a paper on "Realism and Value." Prof. Wildon Carr, Miss Sinclair, Mr. Davies, Mrs. Duddington, Miss Hazlitt, Mr. Burns, Dr. Goldsborough and Mrs. Roberts took part in the discussion.

May 16th, 1922. Miss H. D. Oakeley, in the Chair.—Prof. Nunn opened a discussion on “Prof. Whitehead’s *Enquiry into the Principles of Natural Knowledge* and *The Concept of Nature*.” Prof. Wildon Carr, Miss Sinclair and Mr. Joad took part, and Prof. Whitehead gave an account, in reply to the criticisms on his books, of the relation of his work to the new theories in mathematics and physics.

June 12th, 1922. Prof. Dawes Hicks, Vice-President, in the Chair.—Mr. T. Greenwood read a paper on “Geometry and Reality.” In the discussion Prof. Edmund Husserl of Freiburg, Dr. Thomas, Mr. Constable, Dr. Jeffery, Dr. Tudor Jones and Prof. Wildon Carr took part.

July 3rd, 1922. Dr. F. C. S. Schiller, President, in the Chair.—The Report of the Executive Committee for the Session, and the Treasurer’s Financial Statement, were presented and adopted. The nominations by the Executive Committee of the Officers of the Society for the Forty-fourth Session were approved, and Prof. A. N. Whitehead was declared elected President; Prof. T. P. Nunn, Treasurer; Miss L. S. Stebbing, Librarian; and Prof. H. Wildon Carr, Honorary Secretary and Editor. The following six members to serve on the Executive Committee were elected:—Mr. Delisle Burns, Rev. W. F. Geikie-Cobb, Prof. G. Dawes Hicks, Mr. C. E. M. Joad, Miss May Sinclair and Dr. W. F. Thomas. Mr. Douglas Ainslie read a paper on “Benedetto Croce’s *Historiography*.” In the discussion the President and Prof. Wildon Carr, Miss Sinclair, Prof. Brough, Mr. Mead, Miss Stebbing, Mr. Hannay and Mr. Cator took part.

**JOINT SESSION OF THE ARISTOTELIAN SOCIETY, THE
BRITISH PSYCHOLOGICAL SOCIETY AND THE
MIND ASSOCIATION, HELD AT MANCHESTER,
JULY 14TH-17TH, 1922.**

July 14th. In Hulme Hall at 9 p.m. Sir Henry A. Miers, Vice-Chancellor of the Victoria University, Manchester, in the Chair. The Right Rev. William Temple, Bishop of Manchester, gave the Inaugural Address on "Symbolism as a Basis for Metaphysics." A discussion followed, in which Prof. Wildon Carr, Prof. Lindsay, Mr. Richardson, Mr. Brosnan, Prof. Taylor, Dr. Schiller, Mr. Milburn and Sir Leslie Mackenzie took part. The Bishop of Manchester replied.

July 15th. At the University Arts Building at 10 a.m. Prof. S. Alexander in the Chair. A Symposium on "Are History and Science different Kinds of Knowledge?" by Mr. R. G. Collingwood, Prof. A. E. Taylor and Dr. F. C. S. Schiller, was discussed. Discussion was opened by the writers of the papers. In the general discussion, Prof. Plimpton Adams, Canon Green, Prof. Powicke, Mr. Brosnan, Mr. Richardson, Dr. Moore and Mr. Ainslie took part.

In the Psychological Laboratory at the same hour a meeting was held for the discussion of subjects of experimental psychology. Prof. T. H. Pear in the Chair. Dr. C. S. Myers read a paper on "Experiments on Musical Appreciation"; Mr. F. C. Bartlett, "Experiments on the Process of Conventionalization"; Mr. R. H. Thouless, "Experiments on Contrast Effect in a smoothly graded Disc"; Mr. Eric Farmer, "The Value of Curves of Output"; and Messrs. S. C. Jackson and S. Wyatt, "The Effect on Mental Fatigue of varying duration and quality of Rest Pauses."

At 9 p.m. In Hulme Hall. Prof. T. H. Pear in the Chair. The Chairman referred to the great loss sustained by Psychology and Philosophy in the death of Dr. W. H. R. Rivers, whose participation in the present Congress had been part of the original arrangements. The meeting rose in

silent expression of sympathy. A Symposium on "Is the Unconscious a Conception of Value in Psychology?" by Mr. G. C. Field, Dr. F. Aveling and Prof. J. Laird, was discussed. Dr. Mitchell, Dr. William Brown, Mr. Shand, Mr. Benjamin Rand, Mr. Thouless, Mr. Leonard Russell and Mr. Heath took part.

July 16th. At Hulme Hall at 10 a.m. Prof. Wildon Carr in the Chair. The discussion on the Unconscious was resumed in order to consider the subject with special reference to the concrete facts of psycho-therapy. Dr. William Brown gave some typical cases, and indicated the theory of the unconscious which explained them. Prof. Laird, Mr. Field, Sir Leslie Mackenzie, Mr. Milburn, Mr. Thouless, Mr. Heath, Mr. Ainslie, Mr. Rand and Dr. Schiller took part in the discussion, and Dr. Brown replied.

At 2 p.m. Dr. F. C. S. Schiller in the Chair. A Symposium on "The Relation between Sentiments and Complexes," by the late Dr. W. H. R. Rivers, Mr. A. G. Tansley, Prof. T. H. Pear, Dr. Bernard Hart, Mr. A. F. Shand and Dr. C. S. Myers was discussed. Mr. Shand, Prof. Pear and Dr. Myers opened the discussion, and Mr. Bartlett, Dr. Noble, Mr. Wheeler and Miss Iken took part.

At 5 p.m. Prof. A. N. Whitehead in the Chair. Prof. G. F. Stout's paper on "Mr. Alexander's Theory of Sense Perception" was discussed. Prof. Stout opened the discussion, and was followed by Prof. Alexander.

At 8.45 p.m. Prof. Wildon Carr in the Chair. Prof. A. N. Whitehead read a paper on "The Philosophical Aspects of the Principle of Relativity." The discussion was opened by the Chairman, and continued by Prof. Taylor, Mr. J. E. Turner, Prof. Alexander, Dr. Moore and Prof. Stout. Prof. Whitehead replied.

In proposing the thanks of members to Mr. Nicklen, Warden of Hulme Hall, and to Mrs. Hogg, of Ashburne Hall, for the hospitality offered to the Congress, and for the comfort of the arrangements, Prof. Wildon Carr announced that the Societies had received and had accepted an invitation from Prof. A. Robinson, Vice-Chancellor of the University of Durham, to hold the Congress in Durham in 1923.

THE SPECIAL SESSION OF THE SOCIÉTÉ FRANÇAISE
DE PHILOSOPHIE, HELD AT THE SORBONNE, PARIS,
27—31 DECEMBER, 1921.

The following members accepted the invitation of the Société Française and attended the Session: Mrs. Beer, Prof. Wildon Carr, Prof. S. N. Dasgupta, Mr. T. Greenwood, Mr. C. R. S. Harris, Prof. R. F. A. Hoernlé, Sir Leslie Mackenzie, Miss H. D. Oakeley, the Hon. Eleanor Plumer, Dr. W. D. Ross, Mr. Leonard Russell, Dr. F. C. S. Schiller, Prof. J. Seth, Prof. J. A. Smith, Prof. W. R. Sorley, Dr. Jessie White, and Dr. Dorothy Wrinch.

The following Members contributed papers which will be printed in the Bulletin of the Special Session: Prof. Wildon Carr, "The Nature of Scientific Knowledge;" Mr. T. Greenwood, "The Nature and Function of Geometrical Concepts"; Prof. R. F. A. Hoernlé, "Berkeley as the Forerunner of recent Philosophy of Physics"; Miss H. D. Oakeley, "The Derivation of Value"; Dr. W. D. Ross, "Plato's Later Development of the Ideal Theory"; Dr. F. C. S. Schiller, "Reality, Fact and Value"; Prof. J. A. Smith, "The 'Economic' Theory of the Concept"; Prof. W. R. Sorley, "La Notion de l'État et les Expériences Contemporaines"; Dr. Dorothy Wrinch, "Relativity."

The Session was organized in four sections. The sections were: I. Logique et Philosophie des Sciences—President, M. P. Painlevé; II. Métaphysique et Psychologie—President, M. Henri Bergson; III. Histoire de la Philosophie—President, Prof. Lévy-Bruhl; IV. Morale et Sociologie—President, Prof. C. Bouglé. There were four general Sessions, one for each section; the sections meeting separately in the morning on each day.

The Session opened on December 27th in the Amphithéâtre Michelet at 10 a.m. with an address of welcome to the Delegates of the American, Belgian, English, and Italian Societies, by M. Xavier Léon, President of the Société Française de Philosophie. M. Léon Brunschvicg followed with an impressive "Hommage aux Morts."

The first general Session was held at 2.30. M. Bergson presided. The subject of discussion was "Theory of Knowledge," and the theses submitted were by Prof. Wildon Carr and Dr. Schiller.

The second general Session, on December 28th, was presided over by Prof. Lévy-Bruhl. The subject of discussion was "The Relations of Philosophy with the Sciences from the beginning of the Eighteenth Century." The theses presented were by Prof. W. T. Bush and Prof. F. Enriques.

The third general Session, on December 29th, was presided over by M. Painlevé. The subject of discussion was "The most recent Form of the Theory of Relativity." The theses presented were by Miss Wrinch, Prof. P. Langevin, and M. Painlevé.

The fourth general Session was on December 30th. Prof. C. Bouglé presided. The subject of discussion was "Raison et Société." The theses discussed were by M. Chardon and M. Vermeil.

There were receptions at the Rapprochement Universitaire, at the Sorbonne by the Rector and members of the Council of the University, and by M. Xavier Léon at his home in the Rue des Mathurins. On the evening of December 30th the Delegates were entertained at dinner at the Club de la Renaissance Française by the Société Française de Philosophie. M. Painlevé presided. Prof. Wildon Carr on behalf of the English Societies, Prof. R. B. Perry on behalf of the American Societies, M. Dupréel on behalf of the Belgian Societies, and Prof. Enriques on behalf of the Italian Societies returned thanks to the President and Members of the Société Française for the successful organization of the Session and for their most generous hospitality.

The theses and a report of the discussions will be published in a special volume.

FINANCIAL STATEMENT—JULY 1ST, 1921, to MARCH 31ST, 1922.

1. Ordinary Account.

RECEIPTS.		EXPENDITURE.	
	£ s. d.		£ s. d.
Balance in hand on July 1st, 1921	.. .. 61 2 1	Losses on cheques, etc.	.. .. 0 8 11
Members' subscriptions—		Hire of Conference Hall	.. .. 17 11 6
Current Session	.. .. 150 3 0	Harrison and Sons, for printing, binding, etc.	.. .. 233 11 4
Arrears..	.. .. 45 3 0	Balance in hand on March 31st, 1922..	.. .. 17 9 2
Balance from Oxford Congress	.. .. 195 6 0		
	.. .. 2 12 10		
	<u>£259 0 11</u>		<u>£259 0 11</u>

2. Travelling Expenses Account.

	£ s. d.		£ s. d.
Balance on July 1st, 1921	.. .. 32 15 0	Travelling expenses paid	.. .. 3 0 0
		Balance in hand on March 31st, 1922	.. .. 29 15 0
	<u>£32 15 0</u>		<u>£32 15 0</u>

3. Loan Account.

	£ s. d.		£ s. d.
Amount outstanding on July 1st, 1921	.. .. 66 19 4	Amount outstanding on March 31st, 1922	.. .. 66 19 4
	<u>£66 19 4</u>		<u>£66 19 4</u>

Examined and found correct, June 27th, 1922.

(Signed)

T. PERCY NUNN, Treasurer.

(Signed)

GILES F. GOLDSBROUGH } Auditors.
G. R. S. MEAD

Note by Treasurer.—By a resolution of the Committee the Financial Statement will henceforward be made for a year ending March 31st. As a result, the profit on sales of *Proceedings*, which ordinarily appears in the account, will be carried into next Sessions Statement. Members may, however, be glad to learn that the balance on the Loan Fund will be discharged by the end of the present Session, and that the Society may expect to enter upon the next Session free of debt, and with a sufficient balance at the bank.

LIST OF OFFICERS AND MEMBERS FOR THE FORTY-FOURTH SESSION, 1922-1923.

THE COUNCIL.

PRESIDENT.

A. N. WHITEHEAD, D.Sc., LL.D., F.R.S.

VICE-PRESIDENTS.

BERNARD BOSANQUET, M.A., LL.D., F.B.A. (President, 1894-1898).

G. F. STOUT, M.A., LL.D., F.B.A. (President, 1899-1904).

VERY REV. DEAN HASTINGS RASHDALL, M.A., D.C.L., F.B.A. (President, 1904-1907).

RIGHT HON. VISCOUNT HALDANE OF CLOAN, O.M., K.T., LL.D., F.R.S.
F.B.A. (President, 1907-1908).

S. ALEXANDER, M.A., LL.D., F.B.A. (President, 1908-1911).

HON. BERTRAND RUSSELL, M.A., F.R.S. (President, 1911-1913).

G. DAWES HICKS, M.A., PH.D., LITT.D. (President, 1913-1914).

RIGHT HON. THE EARL OF BALFOUR, O.M., K.G., LL.D., F.R.S., F.B.A.
(President, 1914-1915).

H. WILDON CARR, D.LITT. (President, 1915-1918).

G. E. MOORE, Sc.D., LL.D., F.B.A. (President, 1918-1919).

JAMES WARD, Sc.D., LL.D., F.B.A. (President, 1919-1920).

VERY REV. W. R. INGE, D.D. (President, 1920-1921).

F. C. S. SCHILLER, M.A., D.Sc. (President, 1921-1922).

TREASURER.

PROF. T. PERCY NUNN,

London Day Training College, Southampton Row, W.C.1.

LIBRARIAN.

MISS L. S. STEBBING,

27, Belsize Park, N.W. 3.

EDITOR AND HONORARY SECRETARY.

PROF. H. WILDON CARR,

107, Church Street, Chelsea, S.W. 3.

EXECUTIVE COMMITTEE.

MR. C. DELISLE BURNS.

MR. C. E. M. JOAD.

REV. W. F. GEIKIE-COBB.

MISS MAY SINCLAIR.

PROF. G. DAWES HICKS.

DR. F. W. THOMAS.

HONORARY MEMBERS.

- F. H. BRADLEY, M.A., LL.D., Merton College, Oxford.
 Prof. W. R. DUNSTAN, M.A., LL.D., F.R.S., 38, Cranley Gardens, S.W.
 Prof. JAMES WARD, Sc.D., LL.D., D.Sc., F.B.A., 6, Selwyn Gardens,
 Cambridge.

CORRESPONDING MEMBERS.

- Prof. J. MARK BALDWIN, c/o Harris Forbes & Co., 56, William Street,
 New York.
 HENRI BERGSON, 32, Rue Vital, Paris.
 Prof. J. M. CATTELL, Garrison, New York.
 Senator BENEDETTO CROCE, Trinità Maggiore 12, Naples.
 Prof. JOHN DEWEY, Columbia University, New York City.
 M. H. DZIEWICKI, 11, Szczepańska, Cracow, Poland.
 Prof. HARALD HÖFFDING, Carlsberg, Copenhagen.
 Prof. E. B. TITCHENER, Cornell University, Ithaca, New York.

MEMBERS.

Elected.

1915. DOUGLAS AINSLIE, B.A., Athenæum Club, S.W. 1.
 1885. Prof. S. ALEXANDER, M.A., LL.D., F.B.A., *Vice-President*, 24, Brunswick Road, Withington, Manchester.
 1919. G. ANDERSON, M.A., 552, Lonsdale Street, Melbourne.
 1921. H. M. ANDREWS, 9, Harcourt House, Cavendish Square, W. 1.
 1922. Rev. H. DOUGLAS ANTHONY, M.A., B.Sc., The College, Richmond, Surrey.
 1913. Rev. FRANCIS W. AYRLING, D.D., Ph.D., The Mission House, Brondesbury Park, N.W. 6.
 1916. Prof. J. B. BAILLIE, M.A., D.Phil., Ladyhill, Bieldside, Aberdeenshire.
 1908. Right Hon. The EARL OF HALFOUR, K.G., *Vice-President*, 4, Carlton Gardens, Pall Mall, S.W. 1.
 1912. Prof. SURENDRA NATH BHARAT, M.A., Gaurisankar-Sæter Lille-Elvedalen, Norway.
 1915. Miss B. C. BARFIELD, Bicknell, Athenæum Road, Whetstone, N. 20.
 1915. F. C. BARTLETT, B.A., 32, St. Barnabas Road, Cambridge.
 1919. ROBERT J. BARTLETT, St. Hilda's, Christchurch Avenue, N.W. 6.
 1907. Mrs. MARGHERITA BEER, M.A., 65, College Court, Hammersmith, W.
 1893. E. C. BENECKE, 182, Denmark Hill, S.E. 5.
 1913. Col. E. H. BETHELL, 18, Hyde Park Square, W. 2.
 1888. H. W. BLUNT, M.A., 183, Woodstock Road, Oxford.
 1913. Prof. A. BONUCCI, Perugia, Italy.
 1921. Prof. J. E. BOODIN, M.A., Ph.D., Carleton College, Minnesota, U.S.A.
 1886. Prof. BERNARD BOSANQUET, M.A., LL.D., D.C.L., F.B.A., *Vice-President*, The Heath Cottage, Oxshott, Surrey.
 1890. A. BOUTWOOD, Charity Commission, Whitehall, S.W. 1.
 1919. W. R. V. BRADE, B.A., 34, Kingsmead Road,ulse Hill, S.W. 2.
 1919. W. O. BRIGSTOCKE, B.A., Royal Societies Club, St. James's, S.W. 1.

Elected.

1914. Prof. C. D. BROAD, M.A., D.Lit., The University, Bristol.
 1889. Prof. J. BROUGH, LL.D., Hampden Club, N.W. 1.
 1908. WILLIAM BROWN, D.Sc., M.D., 5, Norham Gardens, Oxford.
 1917. Miss ELSIE M. BRYANT, B.A., Mayfield Hostel, Arbroath Road, Dundee.
 1919. J. BUTLER BURKE, M.A., Royal Societies Club, St. James's Street, S.W. 1.
 1921. L. D. BURLING, 47, Parliament Street, S.W. 1.
 1918. C. DELISLE BURNS, M.A., 3, Keats Grove, Hampstead, N.W. 3.
 1921. E. H. BUTT, M.A., Lower School of John Lyon, Harrow.
 1906. Rev. Prob. A. CALDECOTT, M.A., D.D., D.Lit., Great Oakley Rectory, Harwich.
 1920. Prof. MARY WHITON CALKINS, Wellesley College, Wellesley, Mass., U.S.A.
 1918. Prof. E. T. CAMPAGNAC, M.A., Greengate, Dingle Lane, Liverpool.
 1881. Prof. H. WILDON CARR, D.Litt., *Vice-President and Hon. Sec.*, 107, Church Street, Chelsea, S.W. 3.
 1921. WILLIAM CATMUR, 23, Terrace Road, South Hackney, E. 9.
 1918. GERALD CATOR, 9, Holborn House, Baldwin's Gardens, E.C. 1.
 1918. Prof. G. C. CHATTERJI, B.A., Central Training College, Lahore, India.
 1908. E. C. CHILDS, M.A., 68, North View, Westbury Park, Bristol.
 1918. Miss M. E. CLARKE, M.A., Lynwood, Weymouth.
 1920. Miss H. CLERGUE, Albemarle Club, 37, Dover Street, W. 1.
 1912. Prof. ALBERT A. COCK, B.A., University College, Southampton.
 1907. F. J. O. CODDINGTON, M.A., LL.M., 42, Bank Street, Sheffield.
 1895. STANTON COIT, Ph.D., 30, Hyde Park Gate, S.W. 7.
 1913. G. D. H. COLE, M.A., 13, Bramerton Street, Chelsea, S.W. 3.
 1921. R. G. COLLINGWOOD, M.A., Pembroke College, Oxford.
 1920. F. C. CONSTABLE, M.A., Grenville, Lansdown, Bath.
 1920. F. C. COULTER, M.A., Royal Societies Club, St. James's Street, S.W. 1.
 1922. F. G. CROOKSHANK, M.D., 41, Wimpole Street, W. 1.
 1921. Mrs. P. M. CROTHWAITE, Highfield, King's Langley.
 1917. Right Rev. C. F. D'ARCY, D.D., Archbishop of Armagh, Primate of Ireland, The Palace, Armagh.
 1920. Prof. S. N. DASGUPTA, M.A., Ph.D., Chittagong College, India.
 1912. Prof. WILLIAM L. DAVIDSON, M.A., LL.D., 8, Queen's Gardens, Aberdeen.
 1916. Rev. A. E. DAVIES, M.A., 48, Blenheim Gardens, Cricklewood, N.W. 2.
 1921. Countess DE LA FELD, 1, Carlos Place, Grosvenor Square, W. 1.
 1896. E. T. DIXON, M.A., Billy Dun, Half-Way Tree, Jamaica.
 1912. Miss L. DOUGALL, Cutts End, Cumnor, Oxford.
 1918. Rev. JOHN DRAKE, M.A., B.D., 19, Furnival Street, E.C. 4.
 1918. JAMES DREYER, M.A., B.Sc., D.Phil., Roselen, Gullane, East Lothian.
 1899. J. A. J. DREWITT, M.A., Wadham College, Oxford.
 1911. Mrs. N. A. DUDINGTON, M.A., 13, Carlton Terrace, Child's Hill, N.W. 2.

Elected.

1910. Miss BEATRICE EDGEELL, M.A., Ph.D., 15, Lyon Road, Harrow.
 1917. Rev. A. E. ELDER, 1, Oakfield Villas, Cobham, Surrey.
 1921. GILBERT ELLIOT, M.A., 87, Victoria Street, S.W. 1.
1919. Prof. J. H. FARLEY, Lawrence College, Appleton, Wisconsin, U.S.A.
 1914. ERIC FARMER, M.A., Royal Societies Club, St. James's Street, S.W. 1.
 1920. Prof. A. S. FERGUSON, Queen's University, Kingston, Ontario.
 1912. G. C. FIELD, M.A., D.Sc., The University, Liverpool.
 1914. Miss MARY FLETCHER, 13, Ladbroke Terrace, W. 11.
 1920. Miss I. FLINN, Ormond College, Melbourne.
 1919. Mrs. FORMAN, 18, Drayton Gardens, S.W. 10.
 1922. Miss E. MARGERY FOX, County School for Girls, Beckenham.
 1918. Miss MADGE FULLER, 69, Lansdowne Road, W. 11.
1914. Miss MARJORIE GABAIN, The Manor House, Bushey, Herts.
 1919. E. GARCKE, Ditton House, near Maidenhead.
 1916. Miss H. GAVIN, 27, Belsize Park, N.W. 3.
 1919. Rev. W. F. GEIKIE-COBB, D.D., 40, Cathcart Road, S.W. 10.
 1897. Prof. W. R. BOYCE GIBSON, M.A., Lichfield, Wallace Avenue, Torrak, Melbourne.
 1918. Mrs. MARY H. GIBSON-SMITH, Ph.D., 13, Fox Hill, Selly Oak, Birmingham.
1911. Prof. C. M. GILLESPIE, M.A., The University, Leeds.
 1913. MORRIS GINSBERG, M.A., Teacher's Guild Club, 9, Brunswick Square, W.C. 1.
1900. G. F. GOLDSBROUGH, M.D., 125, Herne Hill, S.E. 24.
 1912. Prof. FRANK GRANGER, D.Litt., 37, Lucknow Drive, Nottingham.
 1920. THOMAS GREENWOOD, L. & L., University College, W.C. 1.
 1921. D. M. GREIG, M.D., 1, Queen Anne's Gate, S.W. 1.
 1921. J. Y. T. GREIG, M.A., Armstrong College, Newcastle-on-Tyne.
 1918. ALBERT GRESHWELL, M.A., M.D., Louth, Lincolnshire.
 1921. Prof. DANIEL GRIFFITHS, Granville House, Pontypool, Mon.
 1922. Rev. Canon F. GURNHILL, B.D., East Stockwith Vicarage, Gainsborough.
1920. M. A. HAFEEZ, M.A., 9/2, Kyd Street, Calcutta.
 1912. J. C. HAGUE, M.A., London Day Training College, Southampton Row, W.C. 1.
1883. Right Hon. Viscount HALDANE OF CLOAN, O.M., K.T., LL.D., F.R.S., F.B.A., *Vice-President*, 28, Queen Anne's Gate, S.W. 1.
 1917. J. S. HALDANE, M.A., LL.D., F.R.S., Cherwell, Oxford.
 1915. Miss S. ELIZABETH HALL, 6, Prince Arthur Road, N.W. 3.
 1921. H. F. HALLETT, M.A., The University, Leeds.
 1920. Miss M. HAMMOND, The University, Birmingham.
 1920. THOMAS W. HAND, The Librarian, Public Library, Leeds.
 1920. A. H. HANNAY, B.A., 28, Thurlow Road, Hampstead, N.W. 3.
 1919. Rev. R. HANSON, M.A., B.D., 30, Holroyd Road, Putney, S.W. 15.
 1913. R. P. HARDIE, M.A., 13, Palmerston Road, Edinburgh.

Elected.

1921. C. R. S. HARRIS, M.A., All Souls' College, Oxford.
1919. MRS. E. THURLOW HARRISON, 3, Devonshire Terrace, Hyde Park, W. 2.
1918. Miss VICTORIA HAZLITT, M.A., Bedford College, N.W. 1.
1918. A. K. HEATH, M.A., 22, Abercromby Square, Liverpool.
1915. Principal H. J. W. HETHERINGTON, M.A., University College, Exeter.
1890. Prof. G. DAWKS HICKS, M.A., Ph.D., Litt.D., *Vice-President*, 9, Cranmer Road, Cambridge.
1919. Rev. EDWARD W. HIRST, Lynton Villa, The Firs, Bowdon, Cheshire.
1912. Prof. R. F. A. HORNÉ, M.A., B.Sc., Armstrong College, Newcastle-on-Tyne.
1918. MICHEL G. HOLMAN, British Empire Club, St. James's Square, S.W. 1.
1916. S. K. HOOPER, M.A., The Rectory, East Horsley, Surrey.
1921. Miss A. A. HORNE, 119, Ebury Street, S.W. 1.
1916. Very Rev. Dean W. R. INGH, D.D., *Vice-President*, The Deanery, St. Paul's, E.C. 4.
1913. ALEXANDER C. IONIDES, jun., 34, Porchester Terrace, W. 2.
1919. N. ISAACS, 53, Hunter Street, Brunswick Square, W.C. 1.
1911. Principal L. P. JACKS, M.A., LL.D., D.D., Shotover Edge, Headington, Oxford.
1918. Rev. J. G. JAMES, M.A., D.Lit., Brynhyfryd, Andover Road, Southsea.
1921. Prof. G. B. JEFFERY, M.A., D.Sc., 365, Pinner Road, Harrow.
1904. Principal F. B. JEVONS, M.A., D.Litt., Bishop Hatfield's Hall, Durham.
1915. C. E. M. JOAD, M.A., 4, The Gables, Hampstead, N.W. 3.
1918. C. B. JOHNSON, M.A., 2, King's Bench Walk, E.C. 4.
1920. R. F. JOHNSTON, M.A., The Forbidden City, Pekin.
1919. Prof. JAMES JOHNSTONE, D.Sc., The University, Liverpool.
1911. Rev. TUDOR JONES, M.A., Ph.D., 14, Clifton Park, Bristol.
1912. Miss E. F. JOURDAIN, D. ès L., St. Hugh's College, Oxford.
1912. J. N. KYNES, D.Sc., 6, Harvey Road, Cambridge.
1916. Prof. J. LAIRD, M.A., 4, Cranmore Gardens, Belfast, Ireland.
1881. A. F. LAKE, Wragaton, Sundridge Avenue, Bromley.
1911. Prof. GEO. H. LANGLEY, M.A., Dacca, Bengal, India.
1898. Prof. ROBERT LATTA, M.A., D.Phil., The University, Glasgow.
1921. JOHN ARTHUR LAW, 29, Southampton Buildings, W.C. 2.
1919. S. C. LAZARUS, B.A., The University, Melbourne.
1915. Miss MARJORIE LEHUS, B.A., 11, Netherhall Gardens, N.W. 3.
1918. Captain A. E. I. LEGGE, Kingsmead, Winkfield, Windsor.
1921. P. LEON, B.A., University College, W.C. 1.
1921. Rev. R. H. LIGHTFOOT, M.A., New College, Oxford.
1908. Prof. A. D. LINDSAY, M.A., The University, Glasgow.
1897. Rev. JAMES LINDSAY, M.A., B.Sc., D.D., Annick Lodge, by Irvine, Ayrshire.
1912. Prof. THOMAS LOVEDAY, M.A., University College, Southampton.
1920. Rev. A. A. LUCE, D.D., Trinity College, Dublin.
1921. Miss JULIA LYON, B.Sc., 18, Mecklenburgh Square, W.C. 1.

Elected.

1911. Prof. WM. MACDOUGALL, M.A., D.Sc., F.R.S., Harvard University, Cambridge, Mass.
1916. O. A. MACE, B.A., Ivy Lodge, Dereham Road, Norwich.
1912. Prof. R. M. McIVER, M.A., The University, Toronto.
1918. Miss E. M. MACKAY, Skucritten House, Oban, Scotland.
1916. Prof. J. S. MACKENZIE, Litt.D., 56, Bassett Road, North Kensington, S.W. 10.
1910. Sir W. LESLIE MACKENZIE, M.A., M.D., 14, Belgrave Place, Edinburgh.
1918. Prof. A. MAIR, M.A., 26, Parkfield Road, Princes Park, Liverpool.
1917. ABDUL MAJID, B.A., P.O. Daryabad, Oudh, India.
1919. Miss JESSIE A. MALLETT, 29, Launceston Place, W. 8.
1919. B. K. MALLIK, B.A., 22, Farndon Road, Oxford.
1922. HENRI E. C. MARIN, 3, Rue Cimara, Paris (16).
1916. Rev. W. R. MATTHEWS, M.A., D.D., King's College, Strand, W.C. 2.
1918. Miss MARGARET MCFARLANE, B.A., 50, Southwood Lane, Highgate.
1921. J. C. MCKERROW, 34, Cartwright Gardens, W.C. 1.
1918. WM. MONTGOMERY MCGOVERN, Ph.D., School of Oriental Studies, Finsbury Circus, E.C. 2.
1899. J. LEWIS MCINTYRE, D.Sc., Abbotsville, Cults, N.B.
1914. G. R. S. MEAD, B.A., 27, Clareville Grove, S.W. 7.
1912. Rev. S. H. MELLONE, M.A., D.Sc., 44, Ridgeway, Golders Green, N.W. 11.
1920. E. MILLER, M.A., 33, Oxford Mansions, Oxford Circus, W. 1.
1889. R. E. MITCHESON, M.A., Charity Commission, Whitehall, S.W. 1.
1921. Prof. WALTER H. MOBBLEY, M.A., The University, Birmingham.
1919. Rev. WILFRED MOON, B.A., Ph.D., Piazza Minerva 74, Rome (19).
1896. G. E. MOORE, Sc.D., LL.D., F.B.A., *Vice-President*, 17, Magdalene Street, Cambridge.
1915. Mrs. G. E. MOORE, 17, Magdalene Street, Cambridge.
1910. Prof. C. LLOYD MORGAN, LL.D., F.R.S., 5, Victoria Square, Clifton, Bristol.
1913. J. MURRAY, M.A., Christ Church, Oxford.
1912. C. S. MYERS, M.D., Sc.D., F.R.S., 30, Montagu Square, W. 1.
1904. Prof. T. PERCY NUNN, M.A., D.Sc., *Treasurer*, London Day Training College, Southampton Row, W.C. 1.
1908. Miss HILDA D. OAKELEY, M.A., 97, Warwick Road, Earl's Court, S.W. 5.
1918. Mrs. HERBERT J. PAGE, 97, Cadogan Gardens, S.W. 3.
1919. HERBERT J. PATON, M.A., Queen's College, Oxford.
1903. Miss E. A. PEARSON, Moxhams, Bradford-on-Avon.
1921. Rev. RICHARD PHILLIPS, M.A., D.Ph., D.D., St. John's Seminary, Wonersh, Guildford.
1916. W. A. PICKARD-CAMBRIDGE, M.A., Worcester College, Oxford.

Elected.

1918. GEORGE PITT-RIVERS, Hinton St. Mary, Dorset.
 1917. HON. ELEANOR M. PLUMER, M.A., Mary Ward Settlement, Tavistock Place, W.C. 1.
 1921. Rev. W. POWELL, M.A., B.D., 34, The Avenue, Hitchin, Herts.
 1922. HANS PRESSBURGER, Ph.D., University College, W.C. 1.
 1913. Prof. A. S. PRINGLE-PATTISON, LL.D., D.C.L., F.B.A., 16, Church Hill, Edinburgh.
 1916. Miss M. PUNNETT, B.A., London Day Training College, Southampton Row, W.C. 1.
1922. OLA RAKNES, 107, Gower Street, W.C. 1.
 1914. ADAM RANKINÉ, Newstead, Monkham's Avenue, Woodford Green, Essex.
 1889. Very Rev. Dean HASTINGS RASHDALL, M.A., D.C.L., F.B.A., *Vice-President*, The Deanery, Carlisle.
 1922. M. B. RAY, M.D., 11, Seymour Street, W. 1.
 1918. Rev. H. MAURICE RELTON, D.D., The Vicarage, Isleworth.
 1918. C. A. RICHARDSON, M.A., 51, Dene Avenue, Lemington-on-Tyne.
 1921. Mrs. RIDDEL, 15, Mount Street, W. 1.
 1920. Mrs. URSULA ROBERTS, 19, Woburn Square, W.C. 1.
 1895. Prof. ARTHUR ROBINSON, M.A., D.C.L., Observatory House, Durham.
 1920. Miss VERA A. ROSENBLUM, M.A., The University, Melbourne.
 1919. Mrs. MARGARET ROSS, 2, Belgrave Crescent, Edinburgh.
 1908. Prof. G. R. T. ROSS, D.Phil., Rangoon College, Burma.
 1921. LEON ROTH, M.A., Exeter College, Oxford.
 1919. Miss E. M. ROWELL, M.A., Royal Holloway College, Englefield Green, Surrey.
 1912. SATIS CHANDRA ROY, B.A., P.O. Ramna, Dacca, Bengal.
 1896. Hon. BERTHARD RUSSELL, M.A., F.R.S., *Vice-President*, 31, Sydney Street, S.W. 3.
 1921. E. S. RUSSELL, M.A., D.Sc., Fisheries Laboratory, Lowestoft.
 1921. LEONARD J. RUSSELL, M.A., Brousterland, East Kill ide.
1905. F. C. S. SCHILLER, M.A., D.Sc., *Vice-President*, Corpus Christi College, Oxford.
 1920. Prof. CONRAD ALFRED SCHIRMER, 1146, Reaney Street, St. Paul, Minn., U.S.A.
 1912. Prof. J. W. SCOTT, M.A., D.Phil., University College, Cardiff.
 1921. Miss ELIZABETH SCOTT, The University, Birmingham.
 1918. W. E. G. SEKVI, M.A., Anibok Chambers, Cape Coast, Gold Coast, West Africa.
 1892. ALEXANDER F. SHAND, M.A., 1, Edwardes Place, Kensington, W. 8.
 1917. G. BERNARD SHAW, 10, Adelphi Terrace, W.C. 2.
 1917. Mrs. G. BERNARD SHAW, 10, Adelphi Terrace, W.C. 2.
 1901. A. T. SHEARMAN, M.A., D.Lit., University College, Gower Street, W.C. 1.
 1911. H. S. SHELTON, B.Sc., 151, Richmond Road, Twickenham.
 1910. Miss F. ROSAMOND SHIELDS, M.A., 289, Cambridge Road, E. 2.

Elected.

1917. Miss MAY SINCLAIR, 1, Blenheim Road, St. John's Wood, N.W. 8.
 1907. W. G. SLEIGHT, M.A., D.Litt., 16, Keadley Road, Streatham, S.W. 16.
 1919. HENRY H. SLESSER, 11, King's Bench Walk, Temple, E.C. 4.
 1916. E. SHARWOOD SMITH, M.A., The Grammar School, Newbury, Berks.
 1908. Prof. J. A. SMITH, M.A., Magdalen College, Oxford.
 1917. Prof. NORMAN K. SMITH, D.Phil., LL.D., The University, Edinburgh.
 1920. Rev. T. J. SMITH, 76, Coppin Street, Melbourne.
 1886. Prof. W. R. SORLEY, M.A., Litt.D., LL.D., F.B.A., St. Giles, Chester-
 ton Lane, Cambridge.
 1908. K. J. SPALDING, M.A., Stoneways, High Wycombe.
 1908. Miss H. M. SPANTON, 1, The Paragon, Blackheath, S.E. 3.
 1911. Prof. CAROLINE F. E. SPURGEON, D. & L., 19, Clarence Gate Gardens,
 N.W. 1.
 1910. Miss L. S. STEBBING, M.A., *Librarian*, 27, Belsize Park, N.W. 3.
 1912. Mrs. ADRIAN STEPHEN, 50, Gordon Square, W.C. 1.
 1918. Rev. C. E. SHAW STEWART, M.A., 6, Queen's Elm Square, S.W. 3.
 1919. J. McKELLAR STEWART, B.A., D.Phil., The University, Melbourne.
 1887. Prof. G. F. STOUT, M.A., LL.D., F.B.A., *Vice-President*, Craigard,
 St. Andrews, Scotland.
 1918. Mrs. ALIX STRACHEY, 41, Gordon Square, W.C. 1.
 1915. OLIVER STRACHEY, 41, Gordon Square, W.C. 1.
 1912. E. H. STRANGE, M.A., 25, Leicester Road, Wanstead, E. 11.
 1915. Prof. KOJIRO SUGIMORI, University of Waseda, Tokyo, Japan.

 1904. F. TAVANI, 92, Loughborough Road, S.W. 9.
 1908. Prof. A. E. TAYLOR, M.A., D.Litt., F.B.A., 9, Dempster Terrace,
 St. Andrews, N.B.
 1915. F. W. THOMAS, M.A., Ph.D., The Library, India Office, S.W. 1.
 1919. Rev. Prof. W. H. THOMPSON, LL.D., St. Stephen's Vicarage, West
 Ealing, W. 13.
 1917. J. M. THORBURN, University College, Cardiff.
 1916. ALGAR I. THOROLD, M.A., 55A, Ebury Street, S.W. 1.
 1922. M. N. TOLANI, M.A., 25, Rathmore Road, Cambridge.
 1921. C. J. TURNADGE, 13, Acacia Avenue, Wembley, Middlesex.

 1917. W. E. URWICK, M.A., 9, Pakenham Road, Edgbaston.

 1919. EUGENE DE VIERPSHA, 2, Longridge Road, S.W. 5.
 1918. Miss F. VOISIN, B.A., 3, Wymering Mansions, W. 9.

 1918. Miss MARION E. WAKEFIELD, M.A., 58, Belsize Park Gardens,
 Hampstead, N.W. 3.
 1920. Rev. LESLIE J. WALKER, M.A., Champion Hill, Oxford.
 1902. JOSEPH WALKER, M.A., Wooldale, Thongbridge, Huddersfield.
 1908. SYDNEY P. WATERLOW, M.A., Parsonage House, Oure, Pewsey,
 Wilts.
 1919. FRANK WATTS, M.A., The University, Manchester.
 1890. Prof. CLEMENT C. J. WEBB, M.A., Holywell Ford, Oxford.

Elected.

1896. Prof. R. M. WENLEY, M.A., D.Phil., D.Sc.; Litt.D., LL.D.
509, East Madison Street, Ann Arbor, Mich., U.S.A.
1907. Mrs. JESSIE WHITE, D.Sc., 49, Gordon Mansions, W.C. 1.
1915. Prof. A. N. WHITEHEAD, D.Sc., LL.D., F.R.S., *President*, 259A, King's
Road, Chelsea, S.W. 3.
1919. T. NORTH WHITEHEAD, B.A., 14, Carlyle Square, S.W. 3.
1919. Miss A. L. S. WISE, 16, West Kensington Gardens, W. 14.
1900. Prof. A. WOLF, M.A., D.Lit., 12, Kewferry Road, Northwood,
Middlesex.
1919. Rev. A. WOOD, D.D., St. John's Seminary, Wonersh, Guildford.
1920. Miss CHARLOTTE WOODS, 13, Cowley Street, Westminster, S.W. 1.
1918. Miss E. M. WORTHINGTON, 75, West Cromwell Road, S.W. 5.
1917. Miss DOROTHY WINCH, D.Sc., Girton College, Cambridge.
1910. Sir FRANCIS YOUNGHEUSLAND, Litt.D., 3, Buckingham Gate, S.W. 1.
1918. Mrs. ZARCHI, B.A., 75, Clifton Hill, N.W. 8.

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(July, 1922.)

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